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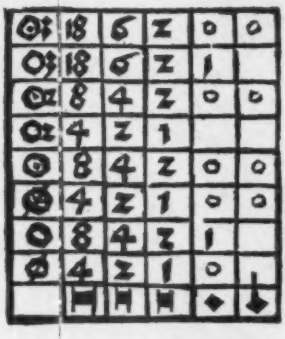

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The Leading Tone in Direct Chromaticism: from Renaissance to Baroque — *John Clough*

The *Proportionale Musices* of Johannes Tinctoris — *Albert Seay*

Music Reading Reconsidered as a Code-Learning Problem — *Stanley Fletcher*

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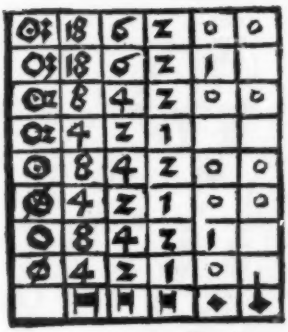

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The Journal of Music Theory is a semiannual scholarly periodical published by the Yale School of Music in November and April of each school year.
Single Issue: $2.00 Volume (two issues): $3.50

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THE LEADING TONE IN DIRECT CHROMATICISM: FROM RENAISSANCE TO BAROQUE

by

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In tracing the employment of chromaticism through the renaissance and the baroque, one discovers a historical parallelism: during the first two-thirds of each era, relatively little use is made of chromaticism, while during the final third of each, its employment rises to a pronounced high point. These two periods of chromatic ascendancy, the late renaissance and the late baroque, bear a curious interrelationship, in that the latter ignores most of the resources developed in the former. For example, the chromaticism of J. S. Bach largely avoids the innovations of de Rore and Gesualdo.

It is not difficult to account for this selectivity. In the baroque the growing sense of tonality led composers to limit their use of chromaticism to those of its varieties which offered the strongest support for a tonal center. Music in a key was a new experience for the baroque listener, and if he was to understand it in its own terms, the fact of tonality had to be driven home to him forcefully and unequivocally. The earliest composers of tonal music could not cloud their works with even an occasional chromaticism contradictory to the tonal center, without risking a complete breakdown in tonal orientation in the listener's mind. Nowadays we are so habituated to tonal music that composers are able to introduce harmonic facts quite distantly related to the tonal center, with some expectation that the listener will cling to even the thinnest strands of connection before allowing his orientation to become non-tonal or polytonal. The baroque composer, on the other hand, was forced by his historical position to throw every possible safeguard around his tonality, employing only those practices which supported, or at least did not endanger, the tonality.

Renaissance chromaticism is therefore properly called pretonal or modal, while its baroque successor may be referred to as tonal chromaticism. In the present article it is my intention to probe beyond this external, though fully valid, comparison, to examine the technical principle which governs chromatic selectivity in the late baroque, and which distinguishes a certain family of chromatic usages as compatible with the clearly tonal harmonic style of that period. As will be shown, this principle is to be found in the occurrence and behavior of the leading tone. Not only does the principle furnish a rigorous definition of baroque direct chromaticism in terms of the leading tone; it also provides a valuable yardstick for the historical evaluation of renaissance chromaticism. Both these facets of the principle will be examined following some necessary preliminary steps and a systematic comparison of renaissance and baroque chromatic usages.

There are three preliminary steps: (1) definition of the term

chromaticism, (2) discussion of the limitations imposed in the present study, and (3) establishment of a differentiating factor in harmonic progression which will permit objective comparison of renaissance and baroque examples of chromaticism.

Chromaticism being essentially the antonymn of the more restrictive term diatonicism, its precise definition rests on a series of definitions beginning with the concept diatonic system:

diatonic system - a succession of whole steps and half steps, of indefinite compass, in which the half steps are separated alternately by two whole steps and three whole steps
diatonic - comprised entirely of tones from a single diatonic system
diatonicism - the use of diatonic collections of tones
chromatic - not comprised entirely of tones from a single diatonic system
chromaticism - the use of chromatic collections of tones

Deserving of comment is the definition of diatonic system, since it is obvious that the remaining definitions hinge directly upon it. The reader will perceive that what is here represented by the term diatonic system is merely the common denominator of such familiar tonal systems as the several ecclesiastical modes and the major scale. There is every reason to believe that this common denominator, or succession of whole and half steps, was employed almost exclusively for more than a thousand years of Western music, beginning with early Christian times. Proof of its supremacy lies in the manner in which the tones were named: The modern series of letter-symbols, a, b, c, d, etc., and its medieval forerunner, represent a diatonic system, as defined above. Consequently, the system is reflected in the meaning of the staff and the design of the modern keyboard. The stigma musica ficta, attached to early deviations from the system, shows the reverence with which it was regarded in medieval and renaissance times. And during the past two hundred and fifty years, when extensive deviation from it and abandonment of it have become the norm of practice, the system has persisted as an important framework of tonal organization. Without doubt, this simple succession of whole and half steps is among the most deeply rooted facts of our musical culture.

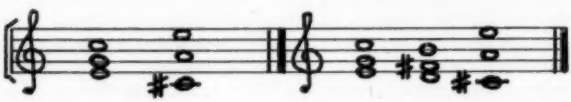
In view of its historical pre-eminence alone, the system deserves to be represented in its pure form by such a basic theoretical concept as diatonic. Modern abstractions such as the harmonic minor and so called "ascending melodic" minor scales, which are sometimes referred to as diatonic, cannot be reconciled with the above definitions without the term diatonic becoming an unwieldy and theoretically useless catch-all. [1]

1. In this connection much confusion derives from the accepted meaning of the expression chromatic scale. (Clearly, the harmonic minor scale is not the chromatic scale; it is therefore diatonic, or so the reasoning goes.) If the presently accepted meaning of chromatic

Two limitations are imposed in the present study, the first being concerned with the chord types to be considered, the second with the distinction between direct and indirect chromaticism. In the light of the above definitions certain traditional chords are seen to be inherently chromatic, namely, the augmented triad, the diminished seventh chord, and the dominant minor ninth, none of these being comprised entirely of tones from a single diatonic system. Only one of the three, the augmented triad, occurs in renaissance music as an essential structure, and this only with great rarity. It is therefore necessary to turn to those chords which are inherently diatonic, for a basis for comparison of renaissance and baroque usages. Of these inherently diatonic chords, the major and minor triads easily outweigh all others in their frequency as essential structures in the renaissance and baroque, and it is only on the basis of chromatic progressions involving these two chords that a meaningful comparison of the two eras is possible.

In dealing with harmonic progressions involving only diatonic essential structures, in this case the major and minor triads, it is necessary to distinguish between direct and indirect chromaticism. In the direct variety the two chords involved in the chromaticism are adjacent; in indirect chromaticism they are separated by one or more essential structures:

Direct Indirect



It is the direct form which will be considered in the present article, since it is in this type of chromatic progression that the leading tone principle applies most rigorously. However, the problem of indirect chromaticism, which will be considered in a later article, also depends largely on the leading tone principle for its solution.

The comparison of renaissance and baroque chromatic practice awaits a final preliminary step: an objective means of comparison must be found. By what criteria shall we recognize as similar or different, two given chromatic progressions from, say, Gesualdo and Bach?

scale is to be retained, we must content ourselves with the paradox that the harmonic minor and "ascending melodic" minor scales, while inherently chromatic, are not "chromatic scales".

Here it might be stated also that, while I am entirely convinced of the soundness of the above definitions, the reader must realize that any doubts he may entertain regarding them can be in no way damaging to the principle to be derived by their use. So long as the concept of chromaticism, as defined above, is clearly understood, I have no essential objection to the reader's substituting his own term for it throughout the article. Universally accepted nomenclature is a desirable objective, but, unfortunately, it sometimes lags behind theoretical thought.

The traditional Roman-numeral symbols will not do. Since most renaissance music has no clear tonal center, the traditionally necessary concept of a hierarchy of chords around such a center is meaningless, and its accompanying symbols are hopelessly cumbersome when applied to late-renaissance chromaticism.

Clearly, another means of comparison is needed, one which makes use of a differentiating factor in harmonic progression, that is common to both eras. In progressions involving only major and minor triads there is one such factor that is common to all eras. It is that quality constituted by (1) the interval of root movement and (2) the succession of triad types, major and minor. Progressions in which these constituents are identical have a similarity in harmonic effect irrespective of their historical context. They bear an identity to one another which is independent of other considerations, such as spacing, doubling, voice leading, and the presence or absence of tonality. Thus the harmonic progression G-c[2] in a renaissance piece, will have a similar basic effect to the progression E-flat — a-flat in a baroque piece, since the interval of root movement is the same in both cases (up a 4th), as is the succession of triad types (major-minor).

TABLE I

Diatonic-chromatic Characteristics of Two-Chord Progressions Involving Major and Minor Triads Only

Root movement	Type-succession of triads			
	M - M	m - m	M - m	m - M
up m2	C	C	C	
up M2				C
up m3	C	C	C	
up M3	C	C		C
up 4			C	
tritone	C	C	C	C
down 4				C
down M3	C	C	C	
down m3	C	C		C
down M2			C	
down m2	C	C		C

Legend

M - major
m - minor
C - chromatic (unmarked progressions are diatonic)

In two-chord progressions involving only major and/or minor triads there are 4 possible successions of triad types and 11 possible

2. Capital letters used as chord symbols denote major triads; small letters, minor triads.

TABLE III

(Recapitulation of TABLE II)
(See page 21)

Renaissance		Baroque
up m3(M-M)		
down M3(M-M)		
up m3(m-m)		
up M3(m-m)		
down M3(m-m)		(Dotted lines indicate
down m3(m-m)		progressions common
up m3(M-m)		to both eras.)
tritone(M-m)		
down M3(M-m)		
up M3(m-M)		
tritone(m-M)		
up m2(M-M)	. . . . .	up m2(M-M)
up M3(M-M)	. . . . .	up M3(M-M)
down m3(M-M)	. . . . .	down m3(M-M)
down m2(M-M)	. . . . .	down m2(M-M)
up 4(M-m)	. . . . .	up 4(M-m)
down M2(M-m)	. . . . .	down M2(M-m)
up M2(m-M)	. . . . .	up M2(m-M)
down 4(m-M)	. . . . .	down 4(m-M)
down m3(m-M)	. . . . .	down m3(m-M)
		tritone(M-M)

intervals of root movement, yielding a total of 44 different progressions. As shown in TABLE I, 26 of these are chromatic.

A convenient shorthand system for denoting the characteristics of these progressions is made available by enclosing the type-succession in parentheses and preceding it with the interval of root movement. Thus the progression a-F sharp would be expressed as "down m3(m-M)".

The groundwork is now laid for an objective comparison of renaissance and baroque chromaticism, the first step of this task being an inquiry as to which chromatic progressions occur in each of the two eras. The musical examples given on pages 15-20 are a condensation of the author's research on this subject. Included is one example of each chromatic progression found in the renaissance and one of each found in the baroque. (The examples are arranged according to their position in TABLE I, beginning with up m2(M-M) in the upper left-hand corner). From the information furnished by this body of material, the leading tone principle will be derived.

TABLE III shows the selectivity of the baroque, which perpetuated less than half the chromatic progressions of the renaissance, adding only one of its own. The renaissance usages, then, fall into two historical groups: those which are peculiarly renaissance, and those which became a part of baroque practice. By reference to the table it is possible to classify given renaissance examples according to these two groups. Suppose, for instance, that the progression up M3(M-M) is encountered in a renaissance piece; TABLE III indicates its close relationship to the practice of the later era.

But does such a discovery not seem, somehow, to be lacking in meaning? It does, for the reason that "baroque practice" is as yet undefined, having merely the status of a group of progressions, the family relationship among which is far from self-evident. The seemingly isolated cases in the group must be subsumed under some definitive principle if the notion of baroque practice is to take on significance.

As previously stated, this principle is concerned with the occurrence and behavior of the leading tone. More specifically, it is the lower leading tone (LLT) which is involved. For this purpose the LLT shall be defined as the third of a major triad, which third progresses (or resolves) upward by a semitone to any tone of the following chord.[3]

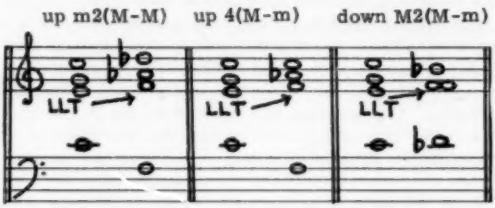
The principle is as follows:

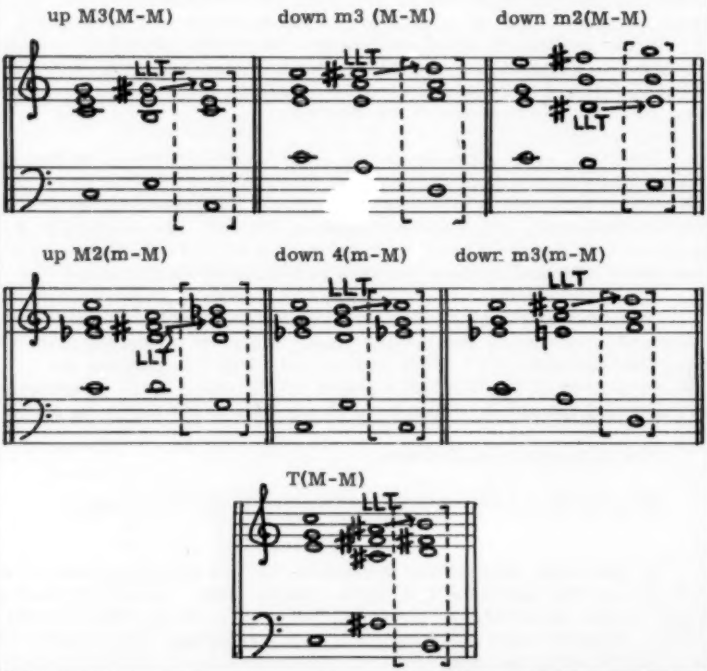
Baroque direct chromaticisms function in one of two ways:

3. No prior justification is claimed for this definition, since the LLT is to serve here as a descriptive device only. Should the reader object to this as arbitrary, the term "factor x", or any other neutral symbol, might be substituted for LLT with no damage to the validity of the principle to be derived.

The Ten Direct Chromatic Progressions
of the Baroque and their Explanation

CONDITION 1 (LLT Resolved)



CONDITION 2 (Potential LLT and diatonic relationship)

(1) by resolving an LLT in the first chord, or
(2) by providing in the second chord a potential LLT whose tone of resolution could serve as the root of a hypothetical third chord mutually diatonic with the first chord. The potential LLT of the second chord need not resolve, though it almost always does, nor must the tone of resolution actually serve as described above. It is only the possibility of these two events which is required. By "mutually diatonic" is meant comprised of tones from the same diatonic system.

On page 8 are illustrated the ten direct chromaticisms of the baroque and the manner in which each fulfills one of the two above conditions.

The ten direct chromatic progressions of the baroque are the only such progressions that fulfill one of the conditions of the definition. This leads to the conclusion that within a limited area, the boundaries of which are very clear, the baroque made full use of the possibilities of chromaticism. The conditions of the definition delimit a family of chromatic usages having common characteristics. The practice of the baroque includes all the members of this family and excludes all others.[4]

Heretofore, baroque chromatic usages have been explained as individuals, as in the following list:

in major	in minor
I - N6	I - V of V[1]
I - V of II	IV - V of V
I - V of VI	IV - V
II - V of III	VI - V
II - V of VI	VI - V of V
IV - V of II	VI - V of IV
IV - V of VI	V - I
V - V of III	V - IV
V - V of VI	V - VI
V of VI - IV	N6 - V

Such a list gives no indication of the interrelationship among its various items. The leading tone principle defines this interrelationship and proves the integral nature of baroque chromatic practice.

The foregoing is in no way intended to invalidate traditional theory, which, at least for the present, must continue to serve as the foundation for the practical pedagogy of late baroque style. For a definition such as the one developed herein to serve as a basis for the

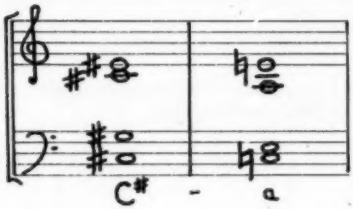
4. To date the following exceptions have been found:
down M3(M-M), which occurs in the chorale prelude "O Mensch, bewein' dein' Sünde gros" from the Orgelbüchlein of J. S. Bach; and
down M3(m-m), which occurs in a setting of the chorale "Warum sollt' ich mich denn grämen" by the same composer.

treatment of chromaticism in the style of Bach, it would have to specify the typical contexts in which each chromatic usage occurs. In its limitation to direct chromaticism, the above definition does not treat of these typical contexts. In its present form the definition must be regarded as a supplement to traditional theory, not a replacement for it.

It is in the historical evaluation of renaissance examples that the definition attains its full stature. It enables one to tell immediately whether or not a given example of late renaissance chromaticism bears any relationship to the baroque, and, in so doing, to give a solid reason rather than a set of vague adjectives.

Consider the following example from Gesualdo:

Gesualdo: "Moro lasso al mio duolo"

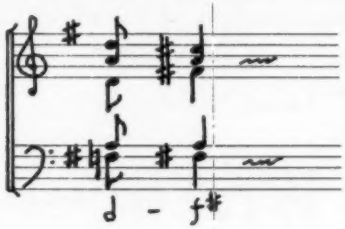


A trained musician would say unhesitatingly that the above progression is foreign to the style of Bach. Asked for proof, he would point to the fact that traditional symbols cannot be used to describe the progression, except in a very far-fetched way, such as A:VofVI -I(3 flat). It is true that the cumbersomeness of the symbol offers a clue to the progression's peculiarly late-renaissance quality. But is there any specific reason why this symbol might not occur in the analysis of baroque music? No, traditional theory offers only a statistical basis for ruling that such a progression is foreign to baroque style: there is no known occurrence of it in the style; it is, therefore, foreign. The usual way of strengthening one's assertions in these matters has been to apply to the progression as many adjectives seemingly contrary to baroque aesthetics as can be found: it is "wild," "unrestrained," "uncontrolled," and "extreme," hence unfit for baroque usage.

In contrast to the above analysis, our definition applies to this problem as follows: there is no LLT in the first chord (the E sharp is not resolved), nor is there a potential LLT in the second chord (since it is a minor triad). As neither of these two conditions is present, the progression is foreign to baroque practice.

Let us turn to another example from the same composer:

Gesualdo: "Invan dunque, o crudele"



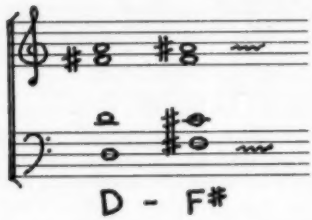
Placing this progression historically, by traditional methods, involves a still more dubious judgment. Its smooth contrapuntal features prevent its being characterized as "wild" or "extreme," and, no doubt, many experienced listeners would hesitate to say that it is foreign to the style of Bach. It may be symbolized traditionally in at least two ways: (1) F sharp minor: VI(3 flat)-I, and (2) D: I(3 flat)-III, neither of which is more formidable in appearance than, say, IV(3 sharp)-V, which would be a very common late baroque progression in a minor key. Since the external appearance of the symbol offers no clue in this case, the only traditional rationale requires knowledge of the possibility of occurrence of a particular set of symbols. The fact is that the set of symbols for the above progression does not occur in the analysis of baroque music, marking the progression as peculiarly renaissance. But again, our definition offers a more reliable method of analysis: both triads are minor; hence there can be no LLT, actual or potential.

To ascertain a given progression's relationship to the baroque, by traditional methods, one must first set down all its possible symbolizations. Each of these must then be examined as to the possibility of its occurrence in baroque music, a procedure requiring knowledge of a vast body of independent facts. If specific knowledge of this sort is held in sufficient quantity, as it is by the average theorist, admittedly the traditional method is as faultless as the leading tone principle. And for the expert in these matters the traditional thought process is not so prosaic as it might seem, probably taking a form closer to intuition than step-by-step calculation. But in any case the traditional proof rests ultimately on the possibility of occurrence of a particular set of symbols.

This would seem to be a less than adequate basis for understanding an historical trend, or for evaluating harmonic facts historically. It requires knowledge of countless independent facts, and fails to answer the question of why certain chromaticisms were considered particularly suitable for tonal music, while others were rejected with rigorously consistent selectivity. Since the answer to this question lies in the LLT and its behavior, there is no need to resort to artificial symbolizations of harmonic progressions in solving the present kind of

historical problem. A chromatic progression's suitability to baroque style depends on its LLT characteristics; so why not deal directly with these characteristics?

In the following example the definition's second condition applies:

Lassus: "Alma nemes"

The potential LLT A-sharp could resolve to the root of a B minor triad, a chord mutually diatonic with the D major triad. The progression is, therefore, one of those employed in the renaissance which was not discarded in the baroque. By such analysis it is possible to judge quickly and accurately whether a given late renaissance chromaticism is forward looking and directed toward the coming era of tonal music, or is destined to lie discarded as being incompatible with the strong tonality of the baroque.

Late renaissance chromaticism stands between two great objects of theoretical thought — the pre-tonal, diatonic practice of the renaissance, and the tonal, partially chromatic practice of the middle and late baroque. Strangely, it appears to play no part in the transition between these two practices. Having thrown off the old shackles of diatonicism, late renaissance chromaticism developed a harmonic vocabulary which precluded any progress in the direction of tonality. Faced with such an apparently isolated phenomenon, music theory must try to associate it with facts and events outside itself. In allowing it to be viewed in terms of the baroque, the leading tone principle overcomes the isolation of late renaissance chromaticism.

SOURCES FOR MUSICAL EXAMPLES

J. S. Bach

Gesellschaft, Breitkopf & Haertel, Leipzig, 1947
"Christ ist erstanden", v. 39, p. 188
"Nun lob', mein Seel', den Herren", v. 2, p. 225
Prelude in A minor, WTC II, v. 14, p. 177
Sonata in F minor for clavier and violin, v. 9, p. 153
3-part invention in E minor, v. 3, p. 29

Francois Couperin

Oeuvres Complètes, Editions de L'Oiseau Lyre, Paris, 1932
Gavotte, v. 3, p. 61

Carlo Gesualdo

8 Madrigale fur Fünfstimmigen Chor, Peters, Frankfort, 1931
"Dolcissima mia vita"
"Hai, gia mia discoloro"
"Invan dunque, o crudele"
"Itene o miei sospiri"
"Moro lasso al mio duolo"

Instituzioni e Monumenti Dell' Arte Musicale Italiana, Ricordi, Milan, 1934
"Ave dulcissima Maria", v. 5, p. 231
"O vos omnes", v. 5, p. 261

Classici della Musica Italiana, Istituto Editoriale, Milan, 1919
"Merce! grido piangendo", v. 14, sec. 4, p. 4

G. F. Handel

Complete Works, Brietkopf & Haertel, Leipzig, 1859
"Acis and Galetea", p. 71

Roland de Lassus

Sämmtliche Werke, Breitkopf & Haertel, Leipzig, 1894
"Alma nemes", v. 3, p. 95
"Christe Dei", v. 3, p. 95
4-part cantiones no. 170, v. 3, p. 96
"Salve regina", v. 10, p. 36
"Timor et tremor", v. 19, p. 7
"Verba mea auribus", v. 20, p. 62

Luca Marenzio

Sämmtliche Werke, Breitkopf & Haertel, Leipzig, 1929
"O voi che sospirate", v. 1, p. 69

Giovanni Palestrina

Le Opere Complete, ed. Fratelli Scalera, Rome, 1939
Magnificat, v. 16, pp. 21, 24
Kyrie from "Missa Petra Sancta"

Henry Purcell

Works, Novello & Co., London, 1904
"The Lord is my Light", vol. of anthems, p. 90

Jean Philippe Rameau

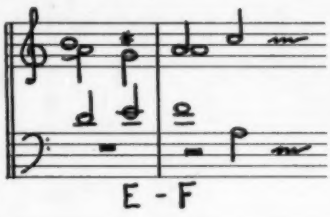
Pièces de Clavecin, A. Durand e Fils, Paris, 1895
"La Villageoise", p. 33

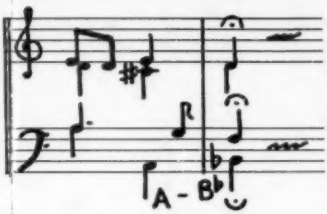
Cipriano de Rore

Madrigals, for 3 and 4 voices, Smith College, Northampton, Mass., 1943
"Datemi pace", p. 115

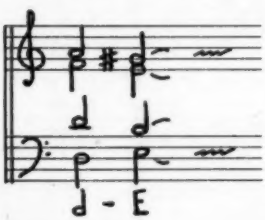
up m2(M-M)

Renaissance
Palestrina: Kyrie

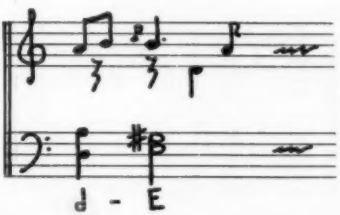


Baroque
Bach: "Christ ist erstanden"

up M2(m-M)

Renaissance
de Rore: "Datemi pace"

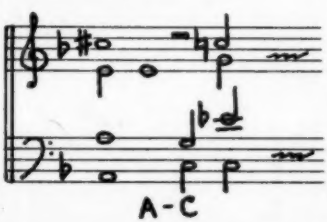


Baroque
Rameau: Courante



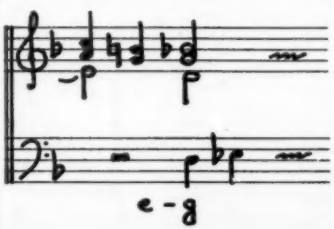
up m3(M-M)

Renaissance
Lassus: 4-part cantiones



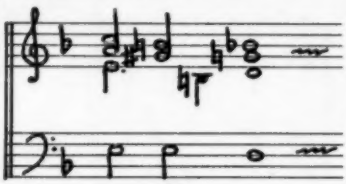
up m3(m-m)

Renaissance
Gesualdo: "Dolcissima mia vita"

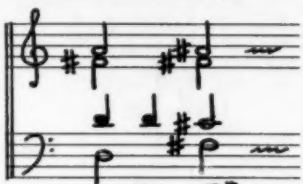


up m3(M-m)

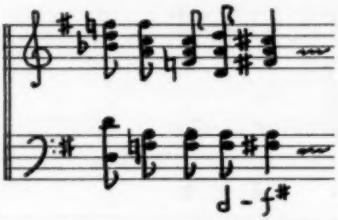
Renaissance
Gesualdo: "O vos omnes"

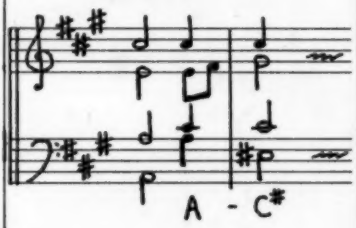


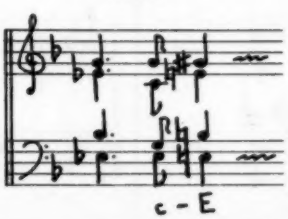
up M3(M-M)

Renaissance
Lassus: "Alma nemes"

up M3(m-m)

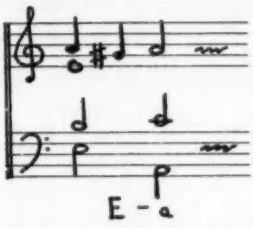
Renaissance
Gesualdo: "Invan dunque,
o crudele"

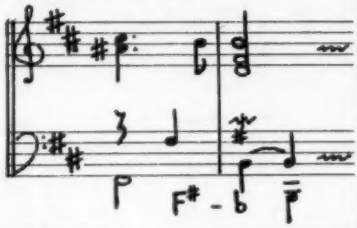


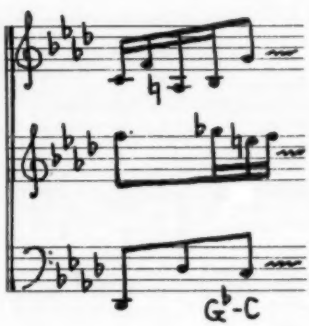
Baroque
Bach: "Nun lob' mein Seel',
den Herren"

up M3(m-M)

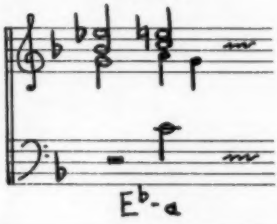
Renaissance
Gesualdo: "Itene o miei
sospiri"

up 4(M-m)

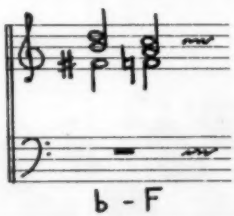
Renaissance
Palestrina: Magnificat

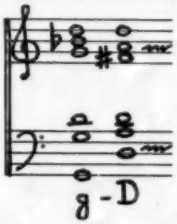


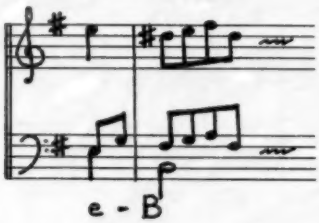
Baroque
Couperin: Gavotte

T(M-M)

Baroque
Bach: "Sonata for Clavier and violine"

T(M-m)

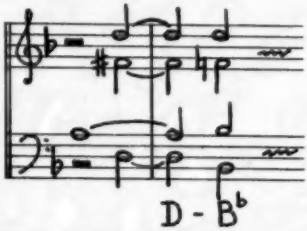
Renaissance
Gesualdo: "Moro lasso mio duolo"

T(m-M)

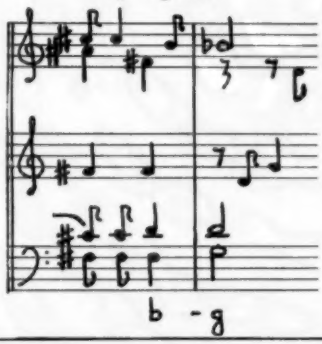
Renaissance
Gesualdo: "Hai, gia mia discoloro"

down 4(m-M)

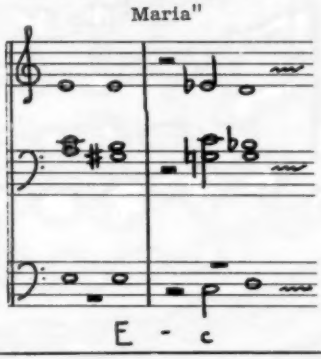
Renaissance
Lassus: "Salve regina"

Baroque
Rameau: "La villageoise"

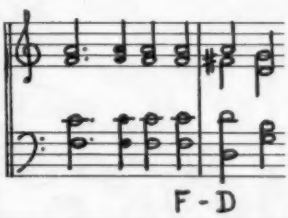
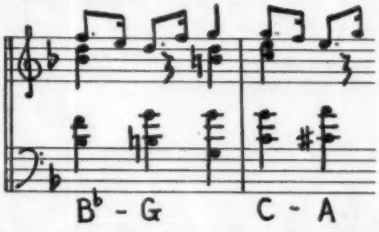


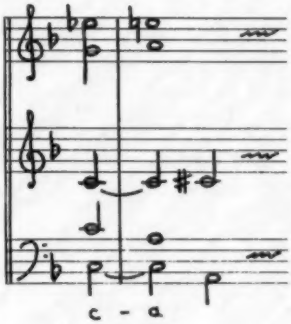
down M3(M-M)

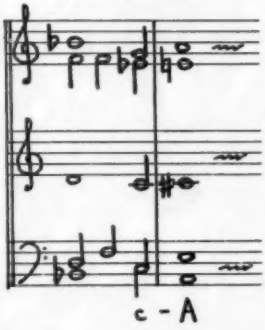
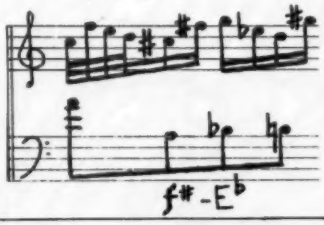
Renaissance
Lassus: "Christe dei"

down M3(m-m)

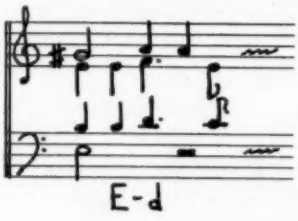
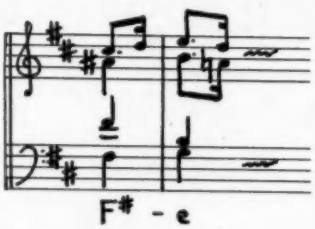
Renaissance
Gesualdo: "Merce! grido piangendo"

down M3(M-m)

Renaissance
Gesualdo: "Ave dulcissima Maria"

down m3(M-M)

Renaissance
Lassus: "Timor et tremor"

Baroque:
Handel: "Acis & Galatea"

down m3(m-m)

Renaissance
Gesualdo: "Itene o miei sospiri"

down m3(m-M)

Renaissance
Marenzio: "O voi che sospirate"

Baroque
Bach: Prelude in a minor, WTC II

down M2(M-m)

Renaissance
Palestrina: Magnificat

Baroque
Purcell: Anthem

down m2(M-M)

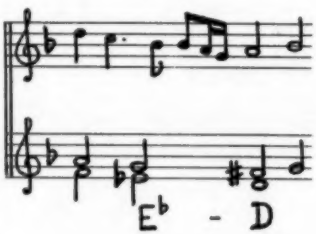
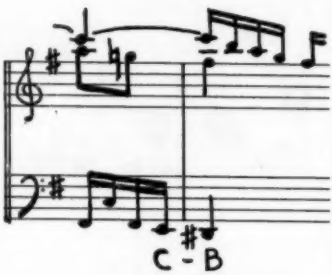
Renaissance
Lassus: "Verba mea auribus"

Baroque
Bach: 3-part invention
in e minor

The form of TABLE I maybe emp'oyed in summarizing the above chromatic material:

TABLE II

Occurrence of Direct Chromaticisms
in Renaissance and Baroque Music

Root movement*	Type-succession of triads M - M	m - m	M - m	m - M
up m2	R B	x	x	
up M2				R B
up m3	R	R	R	
up M3	R B	R		R
up 4			R B	
tritone	B	x	R	R
down 4				R B
down M3	R	R	R	
down m3	R B	R		R B
down M2			R B	
down m2	R B	x		x

Legend

R - occurs in the renaissance
B - occurs in the baroque
x - occurs in neither period

* The cases, prime(M-m) and prime(m-M) are special, as they involve no harmonic progression. Each occurs in both eras.

THE PROPORTIONALE MUSICES OF JOHANNES TINCTORIS

by

Albert Seay
Colorado College

The Proportionale Musices of Johannes Tinctoris (c. 1435 - 1511), integrally presented here in English translation, is the ninth in the series of eleven treatises by this famous theorist published by Coussemaker around the middle of the nineteenth century.[1] Tinctoris seems to have intended these treatises as a "vade mecum" for the practical musician, as he covers all the problems from the simplest fundamentals to the most involved contrapuntal techniques. Even the philosophical side has not been neglected, for the final treatise is given over to a discussion of the effects of music.

As a theorist, Tinctoris shows much of the conflict still raging at his time between those who looked to the past and those who saw that a new and exciting period of music had begun. From the proemia to the various treatises it is evident that he recognized that there was a new kind of music in his own time, written by musicians who stood at the highest point yet reached. The great men of his own generation are familiar to him and he knows their compositions intimately. Even though they may occasionally sin against the dictates of what Tinctoris conceives as reason and logic, he feels that their works show a level of genius that had not been achieved in the past.

Yet, with all this recognition of the great deeds of his contemporaries, Tinctoris is equally aware of the great theoretical traditions handed down from his predecessors, although he may at times disagree with them. The works of the notable theorists of the past, Boethius, Guido and Johannes de Muris, inter alia, have been a part of his background, for he refers to them both directly and indirectly in all of his own treatises. His reading has been wide and voracious, involving nearly all of the standard authors connected with the trivium and quadrivium, the standard educational stages of the Middle Ages.

The Proportionale[2] was prepared sometime before 1475 and shows this broad extent of Tinctoris' knowledge, for the proemium is little more than a rapid survey of the history of music to his own time,

1. Coussemaker, C.E.H., Scriptorum de medii aevi nova series, Vol. IV (Paris 1876), pp. 1-200. A general summary of their contents, as well as a short biography of Tinctoris, is given by Gustave Reese, Music in the Renaissance (New York, 1954), pp. 140-147. It should be remembered that Reese does not take them up in the order printed by Coussemaker, the Proportionale being numbered as the tenth discussed.

2. The Proportionale is found in Coussemaker, op. cit., pp. 153-177.

with emphasis on the, to him, obvious culmination of it all in the composers then living and working, men such as Okeghem, Busnois, Regis and Caron. While these men stand at the pinnacle of greatness, there are still many errors that occur in their works, errors whose reason seems to lie in the lack of a thorough grounding in the rules of proportion as applied to musical composition. It is thus Tinctoris' purpose to give, through the Proportionale, a solid foundation in this branch of composition to those who plan to utilize proportion in their own compositions, and to assist those who must perform works employing the various ratios as an element of the counterpoint.

Proportion in music, as seen by the fifteenth century, is the relation of one group of note values to another, as, in arithmetic, proportion is the relation of one number to another. Such a relation might be five semibreves to be sung in the same time span as four, or three minimae to be sung in the time of two. Some sort of system, easily understood and recognized, had to be used to show these proportions rapidly and clearly, since the primary aim of the whole notational method of the period was to indicate the exact value of any note by the form of the note itself, without reliance upon added dots, figures above the notes or bar-lines marking off units.

The foundation of this system of musical proportion is based, according to Tinctoris, on the assumption that the relationship must always be one that can be expressed between notes of the same type, made up of the same constituents. Here he is inveighing against the too common error of comparing, for example, semibreves including three minimae against other semibreves containing two minimae. In this latter case, the semibreves cannot be compared, for their constituent elements are not the same, the one being three-fold, the other two-fold.

Tinctoris acknowledges the common problem of the performer, whether the proportion represented refers to the previous section within the same voice, or whether it refers to a relationship with another voice. There is no sure answer, so he says, but in general it is always best to assume that it refers to another voice, particularly in those cases when there is a voice that does not change its mensuration, thus making something of a standard against which the proportion in the other voice or voices can be measured.

Indication of proportion is made in several ways, either by coloration of the note itself, or the addition of a tail to its stem, or by the placing of two numbers, one over the other, at the beginning of that section which is to be taken in proportion. The first method is somewhat ambiguous, since coloration can represent not only two different proportions, but also syncopation or imperfection. To assist the performer, Tinctoris does his best to suggest certain rules that will help in the determination of the proper relationship. The second method, the employment of two numbers, is much more clear, since the exact relationship can be shown by the numbers used. Even here, there is a possibility of trouble until the exact level of the proportion is recognized, i.e., whether it refers to minimae, semibreves, breves, etc. Tinctoris implies that there would be no difficulty if composers would take

the trouble to indicate all the elements of mensuration clearly, that is, the two levels of modus, tempus and prolation. Evidently, all too frequently they have been slip-shod in their notation.

Using the methods outlined by Tinctoris, the composer has the possibility of indicating many temporal relationships of a more or less complicated nature, with a guarantee that there will be little or no ambiguity in their execution. A glance at the examples which he gives shows that even the most complex of cross-rhythms can be notated with a minimum of effort and a maximum of clarity. It is regrettable that his solution of the problem was not universally adopted for there remain many questions of interpretation today that must exist unanswered because of the very lack of uniformity in notation so deplored by Tinctoris.

Wherein lies the usefulness of the Proportionale for the modern reader? Is it merely an interesting archeological document, valuable only for the musicologist and with little practical application?

Such an approach would seem short-sighted, in view of the present day interest in the development of rhythmic variety and of rhythmic counterpoint. The systematic study of proportion in music can give a decided fillip to the imagination of the serious student of metre and can show him new and unexplored paths, unexplored since the fifteenth and sixteenth centuries. We have heard for too long complaints against the "tyranny of the barline", and we have in the Proportionale a weapon against this domination. Those composers who have studied this music and the theoretical approach in back of it show a most imaginative response to the problem of rhythm in their own works, with Stravinsky as a supreme example.

Finally, the performer of this music can gain an insight into the real nature of this music, not the usual cliché that this is mathematical composition, but the truer reaction that the composers of Tinctoris' time had discovered something about the nature of polyrhythm which had been allowed to disappear all too soon. With a true understanding of the character of the music and the meaning of its symbols, there can be authentic and accurate re-creations of the great art works of a living past, whose great men are of no lesser stature than today.

A comparison of the English translation and the transcription of the musical examples given here with the text as presented by Coussemaker will disclose a number of differences, differences which can be explained by the fact that the English version has not been based upon Coussemaker's edition.[2] In preparing the first drafts of both text and music, so many difficulties were encountered that it was decided to base the translation and transcription upon a primary source rather than upon that presented by Coussemaker. Most of the difficulties encountered in working with his edition were immediately clarified upon reference to what is probably the best manuscript source, Brussels, Bibliothèque Royale, Ms. II 4147 (Fétis 5274), completely given over to the treatises of Tinctoris. If, therefore, any discrepancies between my English version and Coussemaker's Latin one are noted, may I as-

sure the reader that these variations are due to the use of the Brussels manuscript as the foundation of my translation and transcription.

Within the text proper, Coussemaker's misreadings are of generally minor nature, the greatest errors being confusion of the abbreviations for "tamen" and "tantum", "sed" and "scilicet" and "que" and "qui". Unfortunately, some passages are rather seriously damaged by the omission of key words and the misplacement of sentence ends. All of these can only be rectified by comparison and collation.

The misreadings of the musical examples (or misprints?) are of a much more serious character, for certain ones existing in Coussemaker's text are untranscribable in their state there. The errors are of all kinds, ranging from omission of notes, dots and rests, to a superabundance of same. Of the 63 musical examples within the Proportionale, only a third, 21, are presented by Coussemaker in a correct version.[3]

In closing, it is hoped by this writer that the integral translation of one of the smaller treatises from an earlier stage of our musical history will lead to further efforts in this area. Most students, particularly undergraduates, have no opportunity to come into contact with the great documents of the past, even in the original language, which is all too frequently not a part of their background. An understanding of the music of today is impossible without a comprehension of the past, a thing impossible without the provision of the writings of that past in a language comprehensible to the average student.

3. Four musical examples from this manuscript are given in facsimile by Willi Apel in his The Notation of Polyphonic Music 900-1600 (Cambridge, 1945: 3rd ed.), p. 153. His Example A is taken from De Arte Contrapuncti (Coussemaker, op. cit., p. 152. Comparison will show that only two of the four from the Proportionale that are reprinted by Coussemaker have been reproduced correctly by him.

PROPORTIONALE MUSICES[1]

A study of Proportions in Music, prepared by Master Joannes Tinctoris, Licentiate in Laws and Chaplain to His Most Serene Highness, Ferdinand, King of Sicily, Jerusalem and Hungary, with good omen:

The Introduction begins:

To the most sacred and unconquerable Prince Ferdinand, by the divine providence of the King of Kings, the Lord of Lords, King of Sicily, Jerusalem and Hungary, Joannes Tinctoris, the least among professors of music and his chaplains, kisser of his feet, presents humble and servile obedience.

Although, O most wise King, from the time of the first musician, Jubal, to whom Moses attributed so much, as when he spoke in Genesis of him as the founder of singing to the organ and cithara, many celebrated men such as David, Ptolomy, Epaminondas, the princes of Judea, Egypt and Greece, Zoroaster, Pythagoras, Linus the Theban, Zethus, Amphion, Orpheus, Museus, Socrates, Plato, Aristotle, Aristoxenus and Timotheus gave such pains to the art of natural music that they, by the witness of Tullius, almost comprehended its complete force and its infinite material in their thought, to the end that many of the Greeks claimed that some of them, chiefly Pythagoras, had discovered the foundations of music, whatever they may have said or put down in writing has hardly come down to us, though it is most probable they did this most elegantly. Indeed, they considered erudition as highest in this science, one which Plato calls the most powerful, so that in ancient times everyone studied it, and he who knew nothing of it was thought insufficiently based in background. And how great was that melody by whose power the Gods, shades, dread spirits, animals, including those capable of reason, and inanimate objects are read to have been moved! For (and this is the unbelievable part) it is not far from a mystery, since poets would not have conceived such things about music unless they had seen its power as something to be marveled at, with, at times, a divine invigoration of the soul.

But, after a fullness of time had passed, in which that greatest musician, Jesus Christ (our peace) made both one in duple proportion, wonderful musicians flourished in his church, men such as Gregory, Ambrose, Augustine, Hilary, Boethius, Martianus, Guido, Johannes de Muris, of whom some regulated the use of beneficial singing in the church, others wrote for this purpose hymns and numerous canticles, others left for posterity books on its divinity, others its theory, others the practice of this art (now available to the world at large in various codices). Then the most Christian Princes, of all of whom, most pious King, you are by far the first in spirit, in body and in gifts of your fortune, desiring to glorify the divine service, founded chapels in the

1. The proemium of this treatise has also been translated by Oliver Strunk, and appears in his Source Readings in Music History (New York: 1950), pp. 193-196.

manner of David, in which with huge expense they have appointed diverse singers by whom in diverse voices (not adverse) there is joyful and suitable praise to our God. And, since the singers of these Princes (if they have been set apart by their liberality, which makes great men) are treated with honor, glory and riches, many are most fervently inflamed toward this kind of study. As a result of this tempest, the musical ability of our time has undergone such an increase that it seems to be a new art, of which new art, so I would say, the foundation and origin is considered to have been among the English, of whom Dunstable stands out as leader, and to whom there were contemporaries in France, Dufay and Binchois, from whom immediately succeeded the moderns, Okeghem, Busnois, Regis and Caron, the most outstanding in composition of all those I have heard.

To these the English (who are generally said to "jubilare", while the French "cantare")[2] now are to be compared. The latter at the present time write the newest style compositions, while the former (which is a sign of the poorest talent) always use one and the same manner of composing. But alas! I wonder not only at these but even at many other famous composers, for while they compose so subtly and so ingeniously with incomprehensible smoothness, I have known them to ignore entirely musical proportions or to signify incorrectly those which they do know. I do not doubt that this results from a lack of arithmetic, without which no brilliant achievement in music escapes, for proportion is produced from its entrails.

Therefore, lest youths wishing to learn this liberal and honest musical art be taken by ignorance in these proportions and by error of this kind, for the praise of God from whose gift all things are, and for the splendor of your most Sacred Majesty who stands in piety above other pious princes, as well as for the honor of your most well organized chapel, to which I cannot easily credit a like in the world, I begin this little work which I have thought should be named "A Study of Proportions in Music" through a certain sense of fitness, for the easiest training of the gifted. In this, if I dare to take exception to many and almost all the most famous composers, it is by no means to be ascribed to an arrogance which I deplore; for I do not order my own writings by necessity as above those of others; but fighting for truth, I approve or disapprove those things in regard to proportions which I find right or wrong in them. If I seem to my readers to use this tradition of mine correctly, I encourage them to have faith in me; if indeed they wrongly believe more strongly in others, just as I am prepared to refute others, I am prepared to be refuted by them.

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2. Strunk gives the translation of "jubilare" as "shout" and "cantare" as "sing". I would suggest the meanings to be "improvise melodically" and "compose", since the reputation of English singers as performers was quite high at the time. The positions held by these English vocalists indicate that they could not have held their places on sheer lung power. The distinction implied by Tinctoris' following sentence is one of compositional technique, not of decibel rating.

BOOK I BEGINS

Chapter I

The definition of proportion

Proportion is the relation of two terms to each other. This is the general definition of any proportion, be it that of arithmetic, or music, or geometry. Indeed, as it is specified in the proportion of music, you may speak of two terms, that is, of the musical bodies which are notes significative of pitches.

Chapter II

How and in how many ways proportions are made

This proportional relationship is made, therefore, either in singing or in composing as often as one number of notes is compared to another; this may occur in one of two ways, either when we compare immediately in one and the same voice of a composition notes following preceding ones, as here: (Example 1).

Or when the notes of one voice are referred directly to the notes of the other against which they are set, as here: (Example 2).

Indeed, since the manner of making proportions is two-fold, as has been shown, whether the manner of producing the proportions in the voice part is in the first way, i.e., through relation to the preceding number in one and the same voice, or in the second, i.e., through relation to the notes of the other part, may not be understood according to the signature by the singer except by intuition, or it may be recognized through the counterpoint, wherefore delay and doubt are generated in singing, which should be avoided by all means. When any compositions have been brought to a performing group, they ought to be performed without the slightest hesitation. I may counsel, therefore, that the simple method should be assumed, that is, that the proportions refer to the relationship with the other part, unless it works out that many proportions will be singable in the other way, that is, through relation to the preceding number in one and the same part, that otherwise would not be.

Chapter III

The division of proportions

In proportions some are of equality, others of inequality.

Proportions of equality are those which are made up of equal numbers, as 1 to 1, 2 to 2, 3 to 3, 4 to 4, etc.; and in this type of proportions of equality the types are very specialized, receiving neither specific names in speaking nor positive signs in composition, for whenever we see in any composition no sign of inequality, we judge it composed in equal numbers, as here: (Example 3).

From this is compounded the inexcusable error of Okeghem, who has given a signature in his bucolic song, "L'autre dantan",[3] written in every voice in equal numbers, of not only a sign of proportion, but one which with certain composers indicates triple proportion and with others sesquialtera alone and this incorrectly, as here so: (Example 4).

With the same signatures Dufay also wishes, in the "Qui cum patri" in the "Patrem" of his "Missa Sancto Antonio",[4] to set up a duple sesquiquarta proportion; as a result, if the one use is good, the other is bad; different proportions require different signatures. But as I will prove that this signature in this place has been written incorrectly, then indeed the ignorant may say that since the preceding song, the "L'autre dantan", or some other was similarly marked, we sing it in sesquialtera. O childish ignorance of equality to join to it the proportion of inequality! Nor do I believe that the composer, although he may have written the signature according to others, wished it so performed, but desired that his song should be performed like an excited sesquialtera, for which the drawing of a line through the middle of the circle or of part of it would suffice: for it is proper to show the speeding up of measure by this, whether the tempus be perfect or imperfect, for it so appears in many of his own compositions, where its appearance in either form is such:

Chapter IV

Concerning proportions of inequality

Proportions of inequality are those made up of unequal numbers, such as 2 to 1, 3 to 2, 4 to 3, etc., and of this type of inequality there are subgroup species, since classifications can be arranged.

Only five classifications of inequality have been found to exist, that is, three simple ones, multiplex, superparticular and superpartiens, two made up through combination of these, multiplex superparticular and multiplex superpartiens.

So that confusion will be avoided concerning these, we intend to treat them by signatures, defining each with its various types and with examples of each type, so that, as it pleases the philosopher,[5] we know better by adding the practical.

Chapter V

Concerning the multiplex classification

Multiplex is the classification of inequality in which the larger number when related to the smaller contains the smaller exactly a

3. Reprinted in Droz, E., Thibault, G., and Rokseth, Y., Trois chansonniers français du XV^e Siècle (Paris: 1927), p. 32.

4. Preserved anonymously in Trent MS 90, but not yet available in modern reprint.

5. The reference is to Aristotle.

number of times; for example, twice and it will be duple, three times and it will be triple, four times and it will be quadruple, five times and it will be quintuple, six times and it will be sextuple, and so on.

Concerning duple

Proportion is duple when the larger number related to the smaller contains the smaller exactly twice, as 2 to 1, 4 to 2, 6 to 3, as here: (Example 5).

The octave is said to originate in this Pythagorean proportion, for the reason that, in the discovery of concords, Pythagoras (if the Greeks are to be believed) saw that the octave, a concord of consonants, was made by two hammers, of which one's weight was 6 pounds, the other's 12; from whence it happens that he and many others call this concordance duple and, conversely, this proportion the octave. This particular proportion is customarily employed more than others. And, so far as the minimae, it is not always indicated by some figures, since, if there are 2 minimae to 1, or 4 to 2, or 6 to 3, they are indicated by some color, that is, now they are most commonly solidified in black, i. e., filled in, or minimae of this kind of duple are turned back at their tips by a special tail obliquely to the right side, and in these no final law is set down for not only minimae but other values as well can be filled in and also be made duple; but we use the former method in minor prolation and the latter more frequently in major, as here: (Example 6).

And although 2 minimae are placed here under duple proportion for one, they are not semiminimae because of this, as some unlearned babble; similarly when 2 maximae are written or taken under this proportion for one, 2 longae for one, 2 breves for one, 2 semibreves for one, they are not then called semimaximae, semibreves, semisemibreves.

Concerning triple

Proportion is triple when the larger number related to the smaller contains the smaller exactly three times, as 3 to 1, 6 to 2, 9 to 3, etc., just as here: (Example 7).

Concerning quadruple

Proportion is quadruple when the larger number related to the smaller contains the smaller exactly four times, as 4 to 1, 8 to 2, etc., just as here: (Example 8).

Concerning quintuple

Proportion is quintuple when the larger number related to the smaller contains the smaller exactly five times, as 5 to 1, 10 to 2, etc., as here: (Example 9).

Concerning sextuple

Proportion is sextuple when the larger number related to the smaller contains the smaller exactly six times, as 6 to 1, 12 to 2, etc., just as here: (Example 10).

Chapter VI

Concerning the superparticular classification

The superparticular classification is that in which the larger number related to the smaller contains the smaller and a further amount, for example, one half the smaller and it will be sesquialtera, a third and it will be sesquitertia, a fourth and it will be sesquiquarta, a fifth and it will be sesquiquinta, and thus with others.

Concerning sesquialtera

Proportion is sesquialtera when the larger number related to the smaller contains the smaller and additionally one half of the smaller, as 3 to 2, 6 to 4, 9 to 6, etc., just as here: (Example 11).

Sometimes this proportion is signified without figures, that is, through the solidifying of notes, not only of minimae but of others, with some color, more frequently with black, that is, filled in, as here: (Example 12).

But since this solidification of the notes not only, as has been said above, indicates duple and sesquialtera, but also, as is shown in innumerable works of various composers, may show perfection or reduction, to know easily in any composition which of these four (if it occurs) it signifies, distinguish it thus: either the minimae alone are solidified and then they can be combined as units, and thus whatever and however many they may be in number, they are combined as units: or they cannot be so combined and thus are either binary, and so they may either be syncopated or not in duple, or they are ternary, and so, unless some of them are syncopated, they are in sesquialtera proportion, as here: (Example 13).

And here note that in this example the duple minimae can be syncopated, not however in sesquialtera; therefore, if before a larger or an equal note you see 3 filled minimae, then see if another precedes or follows in syncopation, since then they are sung in duple and not in sesquialtera, as is shown above in the end of the last part of the discantus.

But if only 6 minimae one after the other are so filled in, since it is a six unit, thus being two-fold or three-fold, what must be said? Certainly, if an integral minima precedes or follows, to which the values of these are put in proportion, all are sung under duple; but if not, they are considered in sesquialtera, as here: (Example 14).

And so you may conclude concerning a similar number.

Moreover, if 5 or also 7 continuous filled notes are written, although neither 5 nor 7 is divisible by 2 or 3, each of them, however, is made up of a series of 2 and 3 or the reverse. If an integral minima precedes these 5, the first 2 are taken in duple and the remaining 3 will be taken in sesquialtera. But, on the other hand, if an integral minima follows these 5, the first 3 are taken in sesquialtera, while the remaining 2 will belong in duple; and, concerning 7, when duple precedes sesquialtera, the first 4 will be in duple and the other 3 in sesquialtera, as here: (Example 15).

And so you will act concerning similar numbers.

But these filled minimae may appear not alone but subject to larger notes than themselves, however, and then they imitate completely the character of their accompanying larger notes; by the filling in of this type, either they are imperfected or they are reduced or they are taken in duple proportion or they are taken in sesquialtera.

And now you should understand what has been said about the number and quality of such filled minimae and their value, that is, that both the point of augmentation and the pause attributed to them should be carefully reckoned, as well as the second category, if there are minimae not only filled but bent back (with tails) at their peaks just as has been mentioned above. These two types are seen not only in this work but in examples everywhere. I do not understand Pasquin, [6] however, who, in many passages of his Mass in an irregular first mode which is clearly wanting in all art and melody, disagrees fundamentally with everyone. Nor is it surprising that he disagrees with himself in the "cum Sancto Spiritu", which is very ridiculous, since in the beginning he has worked with us, but at the end against us in this manner: (Example 16).

Either semibreves, breves, longae or maximae may be filled in in this manner, and then (a larger note occurring in between), on the one hand, they are syncopated and so it is a sign of simple reduction or, at the same time, not only of reduction but also of imperfection. On the other hand, they may not be syncopated and then must be reduced or they are reduced in no set order, or not, and thus either they are in themselves perfect and then (if without infraction of the perfection of number they can be taken in sesquialtera) are taken in sesquialtera, if indeed they are not imperfected; or they are in themselves imperfect and then are taken in sesquialtera without differentiation, as here: (Example 17).

What also has been said about the number and quality of these types of notes so solidified must be also understood in terms of their values as I have written about minimae earlier. Yet, if certain untrained people, not even singers, but (what is more intolerable) composers, see notes so put in sesquialtera by filling in, they say they are not in sesquialtera but in hemiolia, asserting that both perfection

6. Little is known about this composer, save that he is named in Cretin's famous Deploration.... sur le trepas de Jean Okeghem, modern reprint ed. by Er. Thoinan (Paris: 1864), p. 33.

and alteration of notes fall in sesquialtera, less often in hemiolia. In this they clearly draw a difference between sesquialtera and hemiolia. But they are mistaken in this matter, for one proportion of the same nature is possible with different names, as on the one hand sesquialtera is frequently the term with arithmeticians, on the other hemiolia with musicians. This came about, as the Pythagoreans say, when Pythagoras had heard born from hemiolia the consonance of the diapente (when he had heard two hammers sounding together, of which the first was of 6 or 8 pounds, the other 9 or 12); and from this both this consonance of the diapente and occasionally this proportion of the diapente are called hemiolia by many.

Nor do I think I should overlook the fact that many older musicians used filled in notes for empty ones, wherefore certain more recent ones say that they are imitating their elders, seeing that, as we have proposed black for white, this was more often done then by color. Therefore, if you wish either to sing or compose such things, attribute everything that has been said about filled notes to empty ones and make your own examples for yourself from the contrary of those given above.

Concerning sesquitertia

Proportion is sesquitertia when the larger number related to the smaller contains the smaller and additionally a third part, as 4 to 3, 8 to 6, 12 to 8, just as here: (Example 18).

This proportion is also more frequently named epitritus by Pythagoreans, for the reason that, according to them, Pythagoras, through the hammer of 8 or 12 pounds to which that of 6 or 9 was in consonance, made this the consonance of the diatesseron not simply by definition, but according to that which he had heard coming forth, so that many call this concordance of the diatesseron epitritus or sesquitertia, and, on the contrary, call this proportion diatesseron.

Concerning sesquiquarta

Proportion is sesquiquarta when the larger number related to the smaller contains the smaller and an additional fourth part, as 5 to 4, 10 to 8, 15 to 12, etc., just as here: (Example 19).

Concerning sesquiquinta

Proportion is sesquiquinta when the larger number related to the smaller contains the smaller and an additional fifth part, as 6 to 5, 12 to 10, 18 to 15, etc., just as here: (Example 20).

Concerning sesquioctava

Also under this classification, as appears to the clearly understanding reader, appears sesquioctava which is the proportion when the larger number related to the smaller contains the smaller and an additional eighth part, as 9 to 8, 18 to 16, etc., as here: (Example 21).

Pythagoras, additionally, when he caused the hammers to strike (of which the first was of 8, the second of 9 pounds), deduced the tone to be caused from this proportion. Wherefore this proportion, often named by Pythagoreans epogdous, sometimes is called a tone and conversely the tone is often called sesquioctava or epogdous.

Chapter VII

Concerning the superpartiens classification

The superpartiens classification is that in which the larger number related to the smaller contains the smaller and additional parts making a total: for example, 2 and it will be superbipartiens, 3 and it will be supertripartiens, 4 and it will be superquadripartiens, and so on.

There are subordinate types within this. These classifications can thus be further divided, so that each sub-type receives individually special names, made up in the principal species from the nominative case of the governing category and in the subsidiary from the accusative plural of the smaller ordinal number. For example, if 5 is compared to 3 the proportion is called superbipartiens tertias, if 7 to 5 superbipartiens quintas, if 7 to 4 supertripartiens quartas, if 8 to 5 supertripartiens quintas, if 9 to 5 superquadripartiens quintas, etc.

Hence, you first define the subalternate species thus:
Superbipartiens proportion is that in which the larger number related to the smaller contains the smaller and 2 additional parts of the latter, as 5 to 3, 7 to 5, etc.

Supertripartiens proportion is that in which the larger number related to the smaller contains the smaller and 3 additional parts of the latter, as 7 to 4, 8 to 5, etc.

Superquadripartiens proportion is that in which the larger number related to the smaller contains the smaller and 4 additional parts of the latter, as 9 to 5, etc.

These were the species most specially to be defined.

Concerning superbipartiens tertias

Superbipartiens tertias proportion is that in which the larger number, which is 5, is related to the smaller, which is 3, as here: (Example 22).

Concerning superbipartiens quintas

Superbipartiens quintas proportion is that in which the larger number, which is 7, is related to the smaller, which is 5, as here: (Example 23).

Concerning supertripartiens quartas

Supertripartiens quartas proportion is that in which the larger number, which is 7, is related to the smaller, which is 4, as here: (Example 24).

Concerning supertripartiens quintas

Supertripartiens quintas proportion is that in which the larger number, which is 8, is related to the smaller, which is 5, as here: (Example 25).

Concerning superquadripartiens quintas

Superquadripartiens quintas proportion is that in which the larger number, which is 9, is related to the smaller, which is 5, as here: (Example 26).

Chapter VIII

Concerning the multiplex superparticular classification

The multiplex superparticular classification is that in which the larger number related to the smaller contains it many times and has a remainder; for example, twice and one half and it is called duple sesquialtera; twice and one third and it is called duple sesquitertia; twice and one fourth and it is called duple sesquiquarta; twice and one fifth and it is called duple sesquiquinta, and so with the rest.

Concerning duple sesquialtera

Duple sesquialtera proportion is that in which the larger number, related to the smaller, contains the smaller twice and one half of the latter, as 5 to 2, 10 to 4, 15 to 6, etc., just as here: (Example 27).

Concerning duple sesquitertia

Duple sesquitertia proportion is that in which the larger number, related to the smaller, contains the smaller twice and one third of the latter, as 7 to 3, 14 to 6, just as here: (Example 28).

Concerning duple sesquiquarta

Duple sesquiquarta proportion is that in which the larger number, related to the smaller, contains the smaller twice and one fourth of the latter, as 9 to 4, 18 to 8, etc., just as here: (Example 29).

Concerning duple sesquiquinta

Duple sesquiquinta proportion is that in which the larger number, related to the smaller, contains the smaller twice and one fifth of the latter, as 11 to 5, 22 to 10, etc., as here: (Example 30).

Concerning duple sesquioctava

And since earlier in the superparticular classification, in addition to the four proportions placed in order, which should suffice to any good intellect to understand the others of the same type, we have made special mention of sesquialtera not of necessity, it is most consistent to show duple sesquioctava in this classification although the skillful investigator can understand it by himself. Duple sesquioctava proportion therefore is that in which the larger number, related to the smaller, contains the smaller twice and one eighth of the latter, as 17 to 8, 34 to 16, etc., just as here: (Example 31).

Chapter IX

Concerning the multiplex superpartiens classification

The multiplex superpartiens classification is that in which the larger number, related to the smaller, contains the latter many times and a remainder; for example, twice and 2 and it is called duple superbipartiens; twice and 3 and it is called duple supertripartiens; twice and 4 and it is called duple superquadripartiens, and thus with others. Within this, indeed, there are subordinate species just as in the superpartiens classification and are hence indicated in this classification. Of these five, each species likewise receives a most special name, made up from the nominative case of the name of the governing category and from the accusative plural of the smaller ordinal number of the subsidiary species; for example, if 8 is compared to 3, it is called duple superbipartiens tertias; if 12 to 5, duple superbipartiens quintas; if 11 to 4, duple supertripartiens quartas; if 13 to 5, duple supertripartiens quintas; if 14 to 5, duple superquadripartiens quintas, etc.

Thus, therefore, the subalternate species must at first be defined; Duple superbipartiens proportion is that in which the larger number, related to the smaller, contains the smaller twice and two parts of the latter, as 8 to 3, 12 to 5, etc.

Duple supertripartiens proportion is that in which the larger number, related to the smaller, contains the smaller twice and 3 parts of the latter, as 11 to 4, 13 to 5, etc.

Duple superquadripartiens proportion is that in which the larger number, related to the smaller, contains the smaller twice and 4 parts of the latter, as 14 to 5, etc.

You define so the species which are the most particular.

Concerning duple superbipartiens tertias

Duple superbipartiens tertias proportion is that in which the larger number, which is 8, is related to the smaller, which is 3, as here: (Example 32).

Concerning duple superbipartiens quintas

Duple superbipartiens quintas proportion is that in which the larger number, which is 12, is related to the smaller, which is 5, as here: (Example 33).

Concerning duple supertripartiens quartas

Duple supertripartiens quartas proportion is that in which the larger number, which is 11, is related to the smaller, which is 4, as here: (Example 34).

Concerning duple supertripartiens quintas

Duple supertripartiens quintas proportion is that in which the larger number, which is 14, is related to the smaller, which is 5, as here: (Example 36).

BOOK II

Chapter I

Concerning proportions of inequality which are made by the relation of a smaller number to a larger

Certainly, just as larger numbers are related to smaller ones through the above mentioned five classifications of proportions of inequality, so the reverse is true, that through them smaller numbers may be related to larger ones; in this you should be certain to change neither the names of these categories nor that of their species, with the exception that "sub" will be placed immediately before any of the composed titles, such as submultiplex, subsuperparticular, subsuperpartiens, submultiplex superpartiens, subduple, subsesquioctava, subsuperbipartiens, subsuperbipartiens tertias, subdupla sesquialtera, subdupla superbipartiens tertias, and thus with others.

The definition, therefore, of any of these may be made just as the subject has been here mentioned earlier and its reverse. Since it is normal with the unlearned that they do not know the above-mentioned 5 classifications with their subsidiary species, I have decided to define them as fully as I deem necessary in order to clear up other matters and to set them forth clearly by use of an example.

Chapter II

Concerning the submultiplex classification

The submultiplex classification is that in which the smaller number, related to the larger, is contained evenly within the larger many times; for example, twice and it will be called subdupla, etc.

Concerning subdupla

Subdupla proportion is that in which the smaller number, related to the larger, is contained in it exactly twice, as 1 to 2, just as here: (Example 37).

Chapter III

Concerning the subsuperparticular classification

The subsuperparticular classification is that in which the smaller number, related to the larger, is contained completely in the larger one time and a remainder, forming a part of the smaller; for example, one-half of the smaller and it is called subsesquialtera, etc.

Concerning subsesquialtera

Subsesquialtera proportion is that in which the smaller number, related to the larger, is contained completely and in addition, one half of the smaller, as 2 to 3, 4 to 6, etc: (Example 38).

Chapter IV

Concerning the subsuperpartiens classification

The subsuperpartiens classification is that in which the smaller number, related to the larger, is contained completely in the larger and additionally has a remainder making a unit; for example, 2 and it is called subsuperbipartiens, and thus with others.

Concerning subsuperbipartiens

Subsuperbipartiens proportion is that in which the smaller number, related to the larger, is contained completely and an additional remainder of 2 making a unit, as 3 to 5. From these figures subsuperbipartiens tertias is constituted. And thus you may compose the other most special types of this particular classification and you may define them correctly according to the following form.

Concerning subsuperbipartiens tertias

Subsuperbipartiens tertias proportion is that in which the smaller number, which is 3, is compared to the larger, which is 5, as here: (Example 39).

Chapter V

Concerning the submultiplex superparticular classification

The submultiplex superparticular classification is that in which the smaller number, related to the larger, is contained in it many times and a remainder forming a part of the smaller; for example, one-half of the smaller and it is called subdupla sesquialtera, and so with

others.

Concerning subdupla sesquialtera

Subdupla sesquialtera proportion is that in which the smaller number, related to the larger, is contained in it twice and has additionally a remainder of one-half the smaller, as 2 to 5, etc: (Example 40).

Chapter VI

Concerning the submultiplex superpartiens classification

The submultiplex superpartiens classification is that in which the smaller number, related to the larger, is contained in it many times and, additionally, has a remainder making a unit; for example, twice and 2 and it is called subdupla superbipartiens, and so with others.

Concerning subdupla superbipartiens

Subdupla superbipartiens proportion is that in which the smaller number, related to the larger, is contained in it twice and additionally has a remainder of 2 as a unit, as 3 to 8. From these numbers subdupla superbipartiens tertias proportion is formed and thus the remaining most special types of this particular classification are constructed and are defined in the following manner.

Concerning subdupla superbipartiens tertias

Subdupla superbipartiens tertias proportion is that in which the smaller number, which is 3, is related to the larger, which is 8, as is seen here: (Example 41).

BOOK III

Chapter I

Certain considerations in regard to proportions

Having treated in particular of the classifications of proportions of inequality with their individual types, I think it necessary to present certain matters generally about these, that is, how, when and where proportions of this category must be signified.

Chapter II

How these proportions must be signified

In regard to the first point, so that you may know how you ought to signify proportions, all proportion is correctly signified with figures, which have the property of signifying a number, as 1, 2, 3, 4, 5, 6, 7, 8, 9, and these are simple figures. Composed figures, however, are infinite in number, as 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, etc., 30, 31, etc., 40, 41, etc., 50, 51, etc., 60, 61, etc., 70, 71, etc.,

80, 81, etc., 90, 91, etc., 100, 101, etc.

The nature of these figures is such that if one be joined to another for any number of times you wish, its value is always increased ten-fold; hence the verse:

"The first is ones, the second tens, the third gives hundreds,
the fourth will give thousands, the fifth ten thousands".

This is the retrograde order, as here: 231471.

Moreover, 0 is often placed before or between the figures, either alone or many times. This figure does not denote a number but rather the augmenting of a number, as here: 700, 3050.

Therefore, if the larger number is referred to the smaller, then you as composer will place the figure of the former above; you will place that of the latter below. If, on the contrary, the smaller is related to the larger, you will place the figure of the former above, that of the latter below, as here: (Example 42).

If the composer should so desire, duple and sesquialtera may be excepted from this rule, for, instead of a sign, the minimae of the former proportion and all the notes of the latter one may be filled in by any coloration so the empty notes of the other portions are left in contrast, as has been shown above in the pertinent places. Some older composers also wished to show both these and other proportions not by figures, but instead by the appropriate names, as here: (Example 43).

This is not pleasing to me, if considered in the light of the familiar proverb, that that which is done quickly is done better; and what is more inept to indicate by a long succession of letters or syllables what could be shown by two small figures? There are also others, almost all of whom, led into this greatest error, show themselves hardly expert in arithmetic, for they signify all the proportions which they use by only one figure, indeed, that of the number which is referred to another, as here: (Example 44).

And nothing is stranger than this to arithmeticians, from whom we take our proportions, to show a proportion by a sign belonging to a number by itself, that is, without any relationship of one number to another, that is, where one is compared relatively to the other.

Moreover, if, for example, we place only 2 or 3 before some notes, since we may compare both 2 to 1, 2 to 3, and 2 to 4, and 3 to 4 and 3 to 5, and so on, why should we understand the proportion to be more probably duple rather than subsesquialtera, or subdupla sesquialtera rather than subsesquitertia, or subsuperbipartiens tertias, or any other proportion constructable from these numbers? They reply that this is because of custom, in which duple and sesquialtera are signified by these single figures, i. e., 2 and 3, both in older and in modern compositions. To these remarks I reply that the leaders of the blind and the blind, who have wandered far from the clarity of the truth about

the science of proportion, must be reguided, not the best teachers of our art and their most brilliant imitators, of whose number was that Binchois who has obtained an eternal name for himself by his most pleasing composition; indeed, he has most properly indicated sesquialtera (according to the royal volume) in his "Patrem" in the third irregular authentic mode thus: (Example 45).

Others, indeed, place for the sign of duple proportion only the sign of tempus imperfectum and minor prolation with a tail drawn through it as that of the speeding up of the measure as has been mentioned above, a method in which the melody is called popularly "cut time" (ad medium), as here: (Example 46).

This, as I am satisfied with De Domarto[7] and Faugues[8] in the Masses, "Spiritus Almus" and "Unius", so using this sign, I find tolerable because of a certain equivalence of the former proportion and the latter prolation; for when something is sung in "cut time", two notes are thus measured through the duple proportion of one.

But certain others signify sesquialtera by a sign of major prolation and tempus perfectum or imperfectum, as is shown in the following: (Example 47).

And others show subsesquitertia by the same sign of tempus imperfectum and major prolation, as here: (Example 48).

That however which Le Rouge and Puyllois do in their Masses, "Mon cuer pleure"[9] and in a particular "Et in terra" in an irregular plagal of the third authentic mode (sic), is intolerable, for sesquialtera or subsesquitertia and this prolation do not coincide, since one semibreve of major prolation worth 3 minimae must not be measured with one or two semibreves of minor, but rather to a semibreve and a minima, as is shown by Dufay in his "Et in terra" from the Mass, "Sancto Anthonio", thus: (Example 49).

Certainly, as to this sign, (since these three most famous composers disagree, Dufay more than the others) believe me, lies the first and most arrogant error of all those setting up proportions; for weakened by the mistake of the English and knowing no proportions, it precipitated all the others. The second error is, however, most simple.

Many, indeed, indicate sesquialtera through the above mentioned sign of tempus imperfectum and major prolation in a reversed form, as ☉, which is also made worse through the prominent solidifying of notes, as Barbingant does in his "Et in terra" in the first authentic

7. Preserved in Rome, Capp. Sist., MS 19. Cf. Robert Eitner, Quellen-Lexikon, III, pp. 225-226.

8. Cf. MGG, III, cols. 1864-1865. The Mass mentioned has not been preserved.

9. This Mass has not been preserved. On Le Rouge, cf. Gustave Reese, Music in the Renaissance (New York: 1954), pp. 92-93; on Puyllois, ibid., p. 48.

mixed mode, who also indicates sesquitertia by the sign of tempus imperfectum and minor prolation with a similarly reversed ↄ, as those whom I fear to name do not blush to use. But I pray they may spare me, since I have felt these signs were so frivolous, so wrong, and so removed from all appearance of reason that I did not believe them worthy of an example.

Chapter III

When proportions must be indicated

In regard to the second matter, that is, when proportions must be indicated, you should have decided to indicate it immediately, in accordance to general custom, the much to be praised reason of the masters, from which, without yielding, you should wish to draw forth any proportion of inequality. On the other hand, for the difference in proportions of equality which are without sign, such are judged to be as we have indicated previously. In this De Domarto sins intolerably many times in his Mass "Spiritus Almus", for in the first parts of the "Et in terra", the "Patrem" and the "Sanctus", where the supremum and contratenors are set in duple in relation to the tenor without a sign, if he has set them equally, he has left the matter confused, as here: (Example 50).

That this is duple is easily proved since two units are compared to one, as is apparent to the observant; nor could it have been excused for the reason that the primary part, that is, the tenor, is sung in major prolation and the secondary parts, that is, the supremum and contratenors, are sung in minor in equivalence, if one remembers that one minima of major prolation must not be measured by two of minor alone, as is shown by Dufay in the example of the preceding chapter. Indeed, I do not wonder at De Domarto, if Regis, Caron, Boubert, Faugues, Courbet and many others, as I have seen in their works, have imitated him in this error, since I have heard that they are but slightly read. And who can attain the truth of not only this or of any other liberal science without reading? But that Okeghem and Busnois, who it is known are preeminent in Latinity, are equal to these in their masses, "De plus en plus" and "L'homme armé", has aroused a complete astonishment in our breast.

For what is more astonishing than the seeing entering the byways of the blind? But since, in their particular manner of composing (if it were marked $\mathbf{O}^{2}_{1}$ as art requires), a difficulty of pronunciation and even a destruction of the whole melody would be heard because of the excessive speed, it would be better to place a canon in the tenor, that is, "Crescit in duplo" (It expands in duple), or its equivalent, just as Dufay has laudably done in his Mass, "Se la face ay pale".[10]

10. Modern reprint in Guglielmi Dufay: Opera Omnia, III, ed. Heinrich Besseler: (Rome: 1950).

Chapter IV

Where we ought to signify proportions

Insofar as the third matter, that is, where, i.e., in what part and in what place, we ought to signify these proportions, it must be said that if there are two or three or many parts in any composed work, the secondary parts may be in either the same proportion or different ones to the primary part. The proportionate parts ought to be signified according to the consideration of the latter and without ambiguity; so that this can occur the signs of the basic proportion should be placed first, just as here: (Example 51).

The primary part of the whole composed song is also the foundation of the relation as it is established from the beginning, since the others regard it as the principal one. And this more frequently, nay rather, almost always the tenor, so called as though holding (tenerus) the other parts subjected to it. This is seen in an infinite number of songs, in which, if the tenor were dispensed with, the other parts would sound improperly discordant to each other and would bitterly offend our ears. Sometimes indeed the upper part is the primary part, that is, when we add to some high song simply composed one or more parts, as here: (Example 52).

Or when above the supremum of any composed melody we produce another new part, as here: (Example 53).

The contratenor, however, is rarely or never a primary part. If, nevertheless, above some precomposed melody we wish to add something, we make it primary, as here: (Example 54).

Secondary parts are indeed all those basically respecting the primary one, as it were, the foundation of the relation.

Indeed, from all these three articles, Busnois alone disagrees, as again and again he signifies his hemiolias, already marked by the filling in of notes, through the addition underneath of that figure 3, as shown in this motet of his, "Animadvertere":[11] (Example 55).

In this it is considered by all as superfluous, since the filling of the notes suffices, inadequate, since, if it needs a sign in figures one figure does not satisfy, and in disorder, since what must be put at the beginning has been put underneath.

Chapter V

It must be considered in what Modus, Tempus and Prolatio proportions are made

Then it must be noted that in any proportion we ought to consider in what modus, in what tempus and in what prolatio it is made; for cer-

11. This motet has not been preserved.

tain proportions are binary, as duple, quadruple, etc.; certain ternary, as triple, sesquialtera, etc.; certain both, as sextuple, sesquiquinta, etc.; certain neither, as sesquiquarta, superbipartiens tertias, etc. They, however, cannot change the nature of the quantities in which they are made; regardless whether any proportion be either binary, or ternary, or both, or neither, always the notes must be computed according to their perfection or imperfection in respect to the modus, tempus and prolatio sign under which they fall, as here:

> Duple and sesquialtera in perfect modus in both meanings,[12] imperfect tempus and minor prolation: (Example 56).
>
> Duple sesquialtera, sesquitertia and subsesquialtera in imperfect modus in both meanings, perfect tempus and major and minor prolation: (Example 57).

In this De Domarto has erred many times in his Mass, "Spiritus Almus", for duple having been indicated under the sign of perfect tempus, he used notes computed in imperfect tempus, and here thus: (Example 58).

And, not withstanding Busnois and Regis in their masses, "L'homme armé"[13] and those following them in all their works, it could not be excused him for the reason that, in the portions of this type in the Mass, minor modus is perfect, and indeed the perfect circle with the figure 2 denotes this, since this perfect circle, as is shown everywhere in their works, is not a sign of modus, but rather of perfect tempus; the figure 2, indeed, that of diminishing, according to them indicates duple; imperfect minor modus, however, is indicated rationally by the placing before or between of pauses occupying three spaces, just as Eloy, whom I have accepted as most learned in the matter of modus, has done in his Mass, "Dixerunt discipuli".[14] The parts of this modus must be signified in the manner given here: (Example 59).

Moreover, more than once this same De Domarto has erred in his previously mentioned mass "Spiritus Almus", in these matters, since he has wished for notes of sesquialtera set up under the sign of minor prolation to be enumerated as though of major prolation, as here: (Example 60).

And, under the same sign, Cousin, in his Mass, "Nigrarum"[15] has also notated this same sesquialtera proportion in perfect tempus, as here: (Example 61).

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12. The two meanings are those of major modus, the relation of the maxima and longa, modus minor, the relation of the longa and breve.

13. Both are reprinted by Lawrence Feininger in Monumenta polyphoniae liturgicae Sanctae Ecclesiae Romanae, Series I (Rome: 1947 seq.)

14. Preserved in Rome, Capp. Sist. Ms. 14. Cf. MGG, III, cols. 1292-1294.

15. This Mass has not been preserved.

Thus, we may consider the difference of these composers not of small authority; under one and the same sign, the first, that is, De Domarto, perfects semibreves and imperfects breves, the second, that is, Cousin, on the contrary imperfects semibreves and perfects breves; it is necessary that one has erred. And in truth both have made omissions, De Domarto in the sign of prolation, Cousin in that of tempus and both in that of proportion. For De Domarto ought to have signified thusly, , since there prolation was major; Cousins thus, , since tempus is perfect.

I suggest, therefore, that in any proportion any quantity not immediately identical to itself be immediately signified; as for example, of binary proportion, imperfect modus, imperfect tempus and minor prolation; of ternary, perfect modus, perfect tempus and major prolation; of both and of neither in any order.

Chapter VI

How it must be understood to refer some notes to others

Also, since in any proportion some notes are said to refer simply to others either equally or unequally, it must be understood how those of the same value are related; for example, when 3 semibreves are compared to 2, if any of the former are worth 2 minimae, certain of the latter ought to be also worth 2. And although notes proportionately related may be of the same quantity and the notes to which they are referred of another, the former must be computed by a certain understanding according to the quantity of the latter, for otherwise we are often led astray in our number; namely if, in other words, seeking to refer 3 to 2 as sesquialtera, we set up 3 breves of imperfect tempus against 2 of perfect, we have made not sesquialtera, nor rather any proportion of inequality, but of equality, that is 6 to 6, as here: (Example 62).

Nor, if on the contrary 3 breves of perfect tempus are referred to 2 of imperfect, is sesquialtera set forth but duple sesquiquarta; for they were 9 to 4 of the same value as they should be. In this Dufay in his "Qui cum patre" from the Mass, "Sancto Anthonio", has most wonderfully erred, for there he has desired to signify that very proportion, i.e., duple sesquiquarta, since he has referred 3 perfect breves to 2 imperfect ones by that sign by which he and almost all others have signified sesquialtera, that is a diminishing, as is seen here: (Example 63).

In this indeed he ought to have signified it thusly: ; for it is not sesquialtera, nay rather, as we have shown above, as is obvious, it is duple sesquiquarta.

Chapter VII

Concerning number and its parts: as much as is necessary for understanding proportions

Finally, for the reason that it is necessary for those desiring to understand proportions to know some few things about number, I have decided to show those things which have seemed to me as necessary for this, and I begin from this definition of number. From whence number is a multitude constructed from unities, as: 2, 3, 4, 5, 6, 7, 8, 9, 10, etc. Nor is 1 properly a number, but the material of number and an element of arithmetic, just as the unison of music, the point of geometry and the instant of astrology. Every number, indeed, is either even or uneven. The even number is that which can be divided in two equal parts, as 2, 4, 6, 8, etc. The uneven number is that which cannot be divided in two equal parts, as 3, 5, 7, 9, etc.

Moreover, every number, regardless of what may be its particular total, is made up of different parts. Certain parts are either factors or non-factors. A factor part is that which taken many times gives the total exactly, as 1 is a factor part of 4, since 1 taken four times gives 4 exactly. A non-factor part of a number is that which taken many times exceeds the total or does not arrive at it, as 3 is a non-factor part of 8, since if 3 is taken 3 times, it gives 9 and thus is more than 8. If, on the other hand, it is taken twice, it gives only 6 and thus does not arrive at 8.

Moreover, every ternary number, that is, one divisible by 3, according to musicians is perfect, as 3, 6, 9, 12, etc. The reason for this is that it belongs to perfect quantities, that is, either modus perfectus, tempus perfectum and major prolation.

And every binary number, that is, one divisible by 2, is imperfect, as 2, 4, 6, 8, 10, 12, etc. The reason for this is that it belongs to imperfect quantities, that is, either modus imperfectus, tempus imperfectum and minor prolation. And since 6, 12, and similar numbers are both ternary and binary, because they are divided by 3 and by 2, they can be in various circumstances perfect and imperfect, perfect under perfect quantities and imperfect under imperfect.

Moreover, every number is either alone or related to another. A lone number is that which is set forth without any relationship, as 1, 2, 3, 4, 5. A related number is that which is compared relative to another, as 2 to 2, 3 to 3, etc.

Of these unequal numbers, hence, one is larger, the other smaller. The larger number is that which exceeds the number to which it is referred as if 3 be referred to 2, the former exceeds the latter by one. The smaller number is that which is exceeded by the number to which it is related, as if 2 be related to 3, the former is exceeded by the latter by one. And from this type of numbers, that is, those which are related, all proportion, as is seen above, is drawn.

Chapter VIII

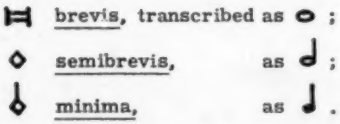
The conclusion of this work

Your Tinctoris, O most clement King, has treated those particular items concerning musical proportions both specially and generally, that is, he has not tinted them with the highest devices of rhetoric for reasons placed in the proemium, so that he may deserve to attain both the grace of God by the prayers of some, if there are those who profit by these things, and also your favor, by which he can live in the present and in centuries to come well and blessed.

MUSICAL EXAMPLES

A Note on Transcription

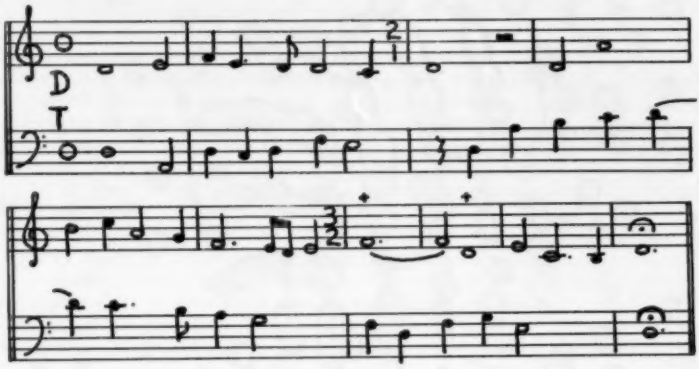
The original note values have been reduced by half, so that the following equivalents result:

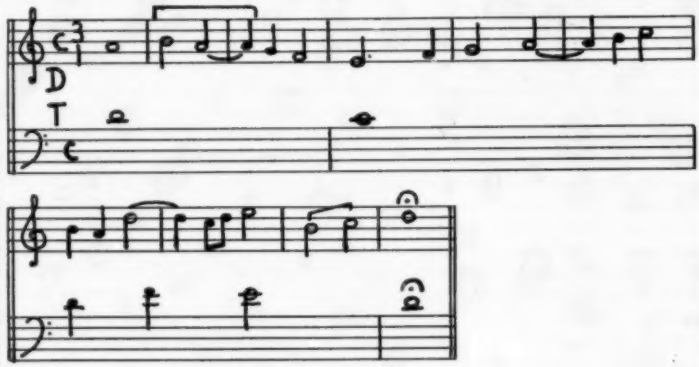


Fifteenth century notation employed blackened notes to indicate a value less than the unblackened note with the same shape. The decreased value could be one-half, two-thirds, or three-quarters of the original value. The practice of writing two , totalling , was so common that the was ordinarily called a semi-minima. Tinctoris, however, understands to be two in duple proportion and, as such, to be included under more general rules governing the use of blackening in proportion. In order to give a more literal picture of the original notation, and thereby illustrate Tinctoris' discussion, we have transcribed all by . The coloration of larger values is indicated in the transcription by a cross placed over the note. Altogether this results in anomalies in the transcription into modern notation, but shows how the rules of imperfection, alteration, and proportion are to be applied. For information concerning imperfection and alteration, discussed by Tinctoris in other treatises, see Willi Apel, The Notation of Polyphonic Music, fourth edition, pgs. 107-115.

The signs of mensuration and proportion appear exactly as in the original. "T" means "Tenor", "D" "Discantus". Ligatures are indicated by a bracket over the notes involved.

Example 1



Example 2

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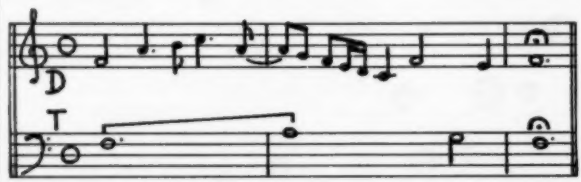
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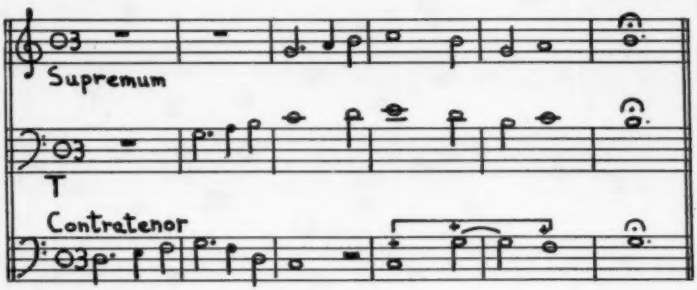
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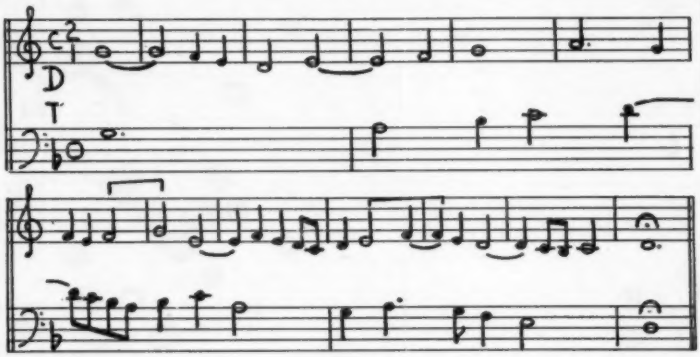
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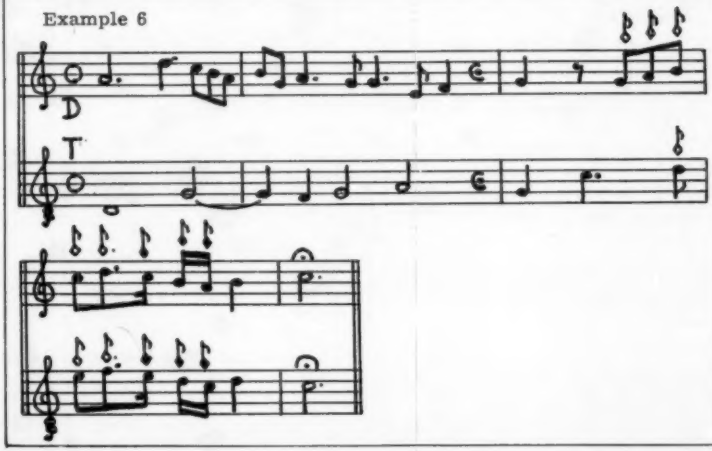
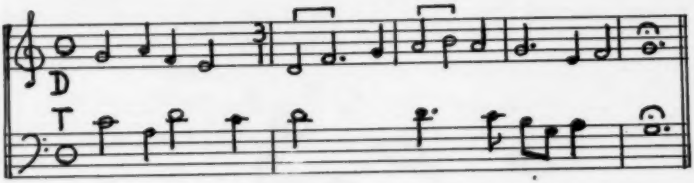
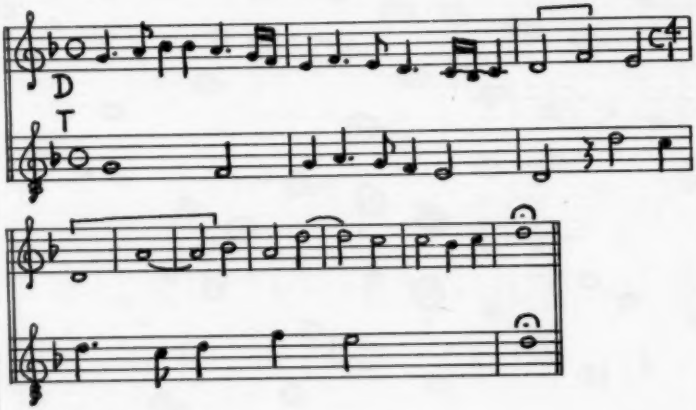

Example 7



Example 8

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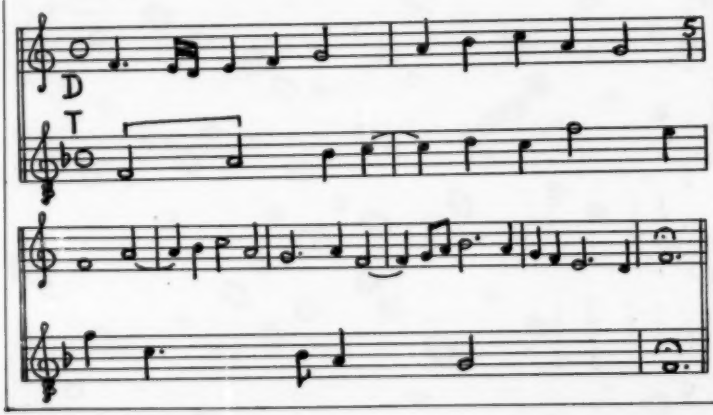

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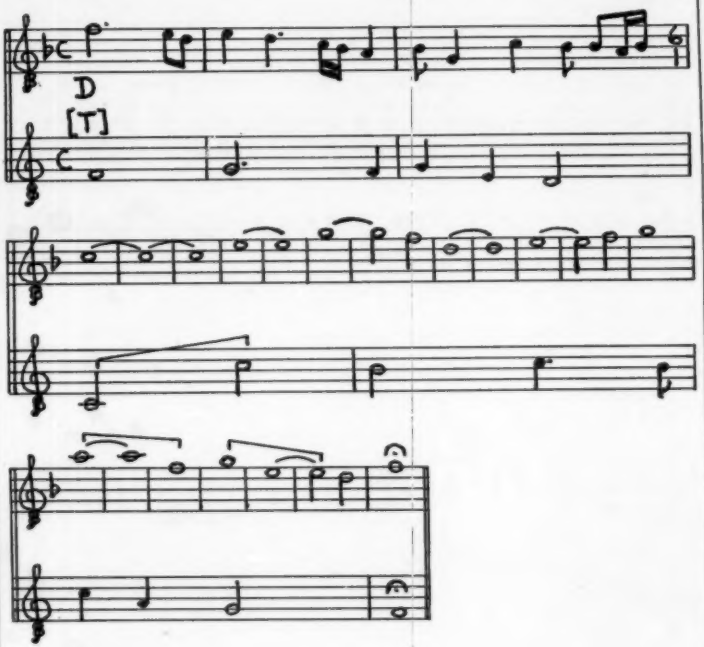
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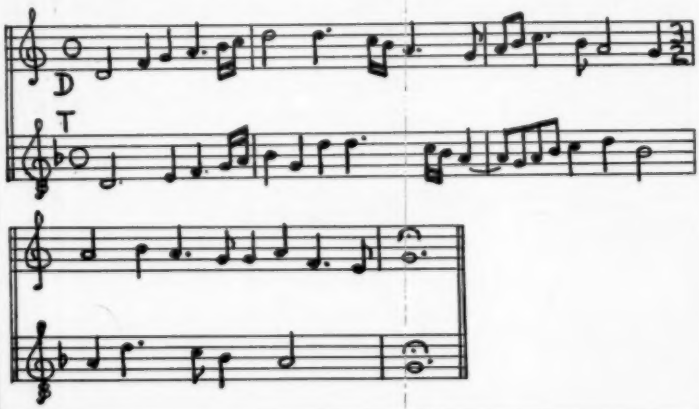
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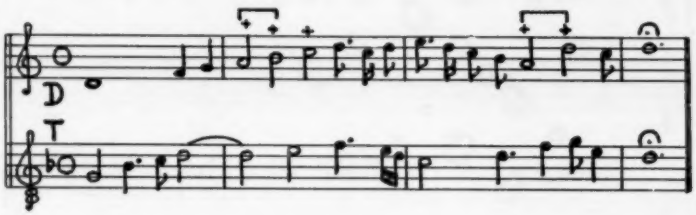

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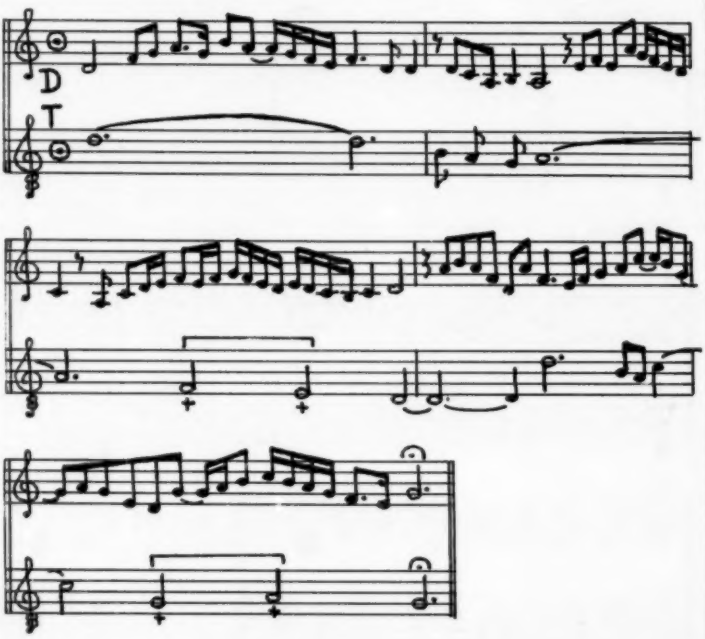
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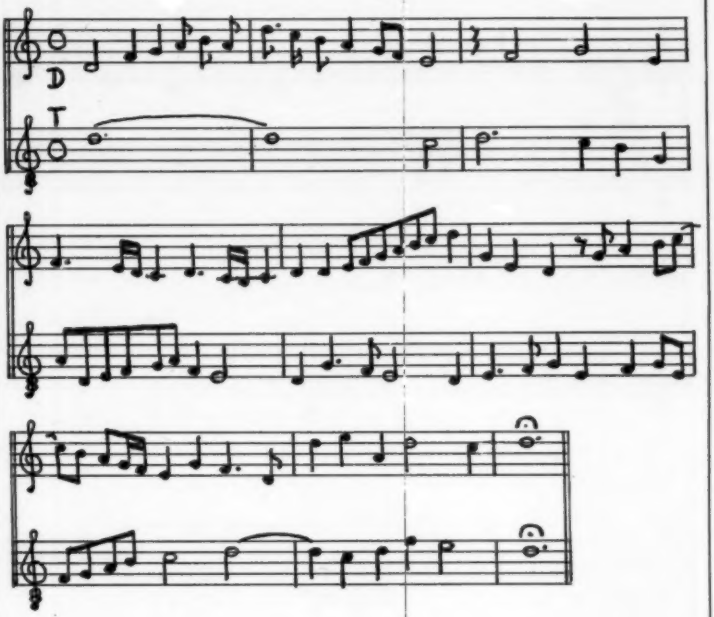
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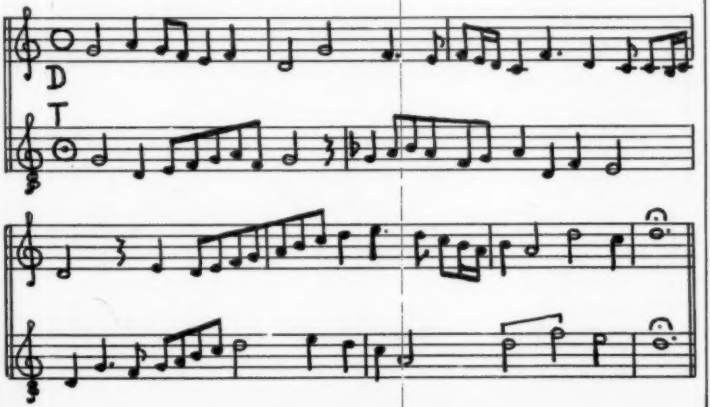
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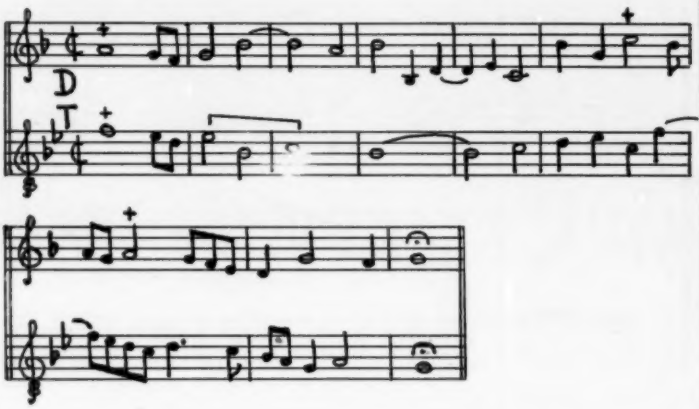
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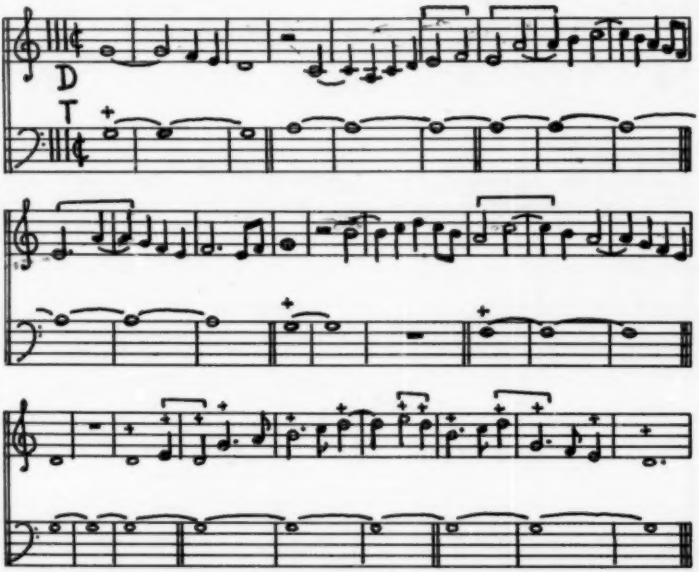
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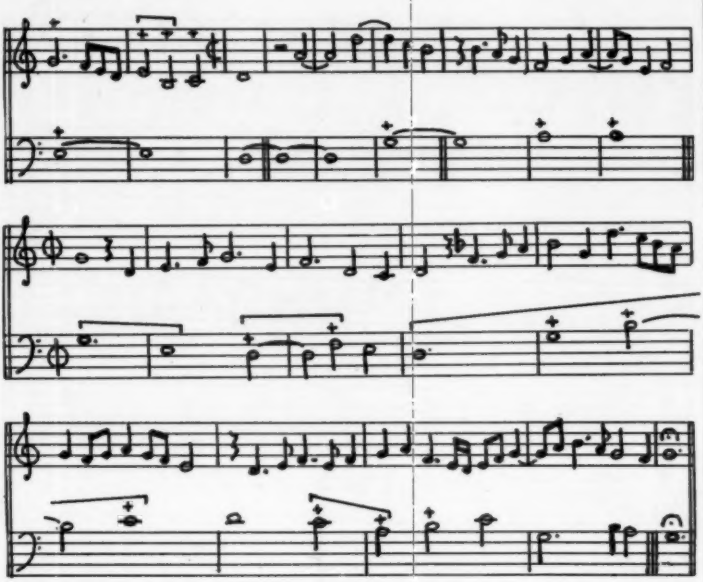
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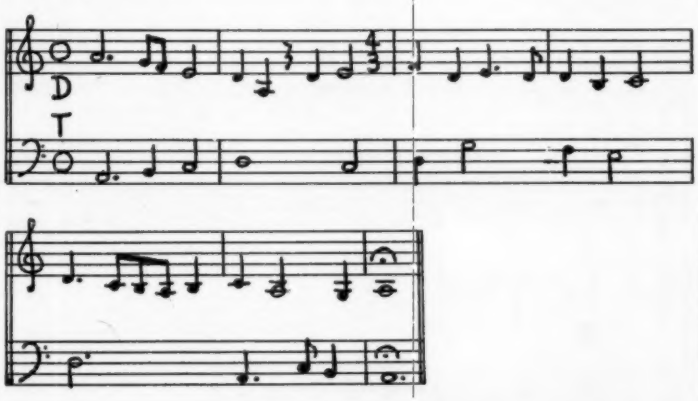
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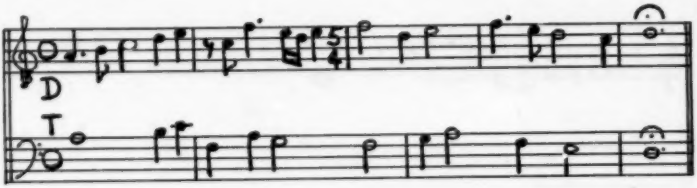

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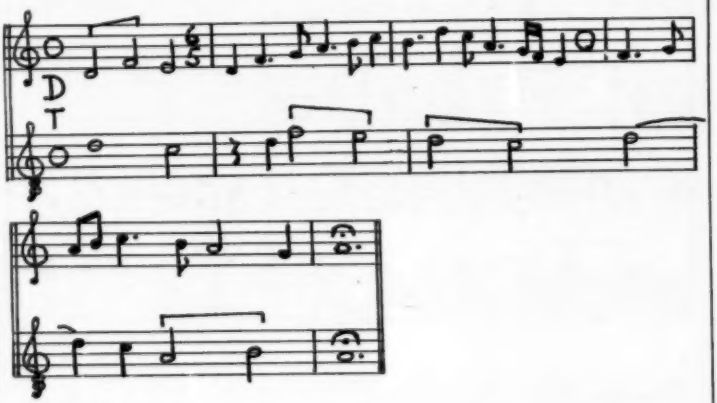
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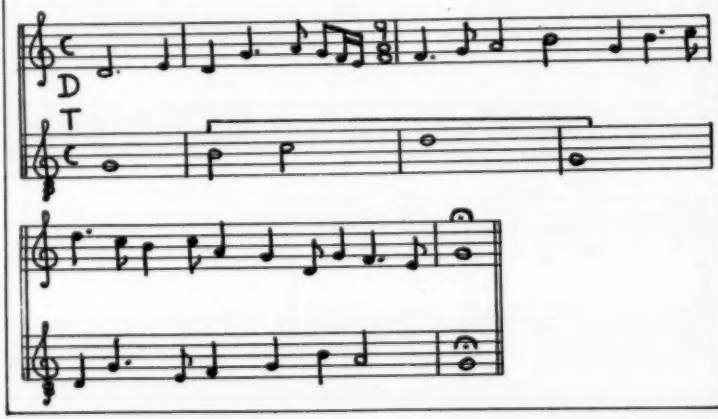
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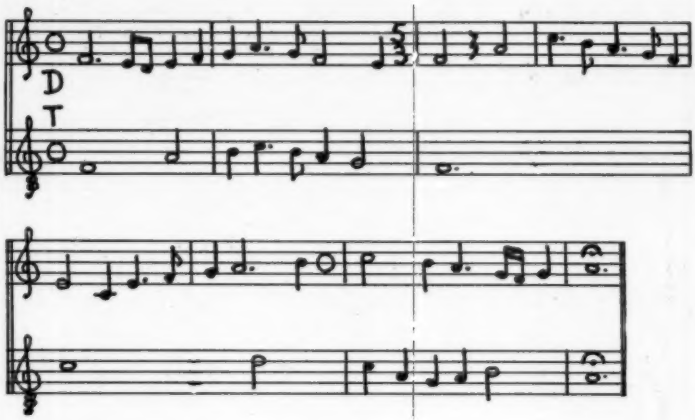

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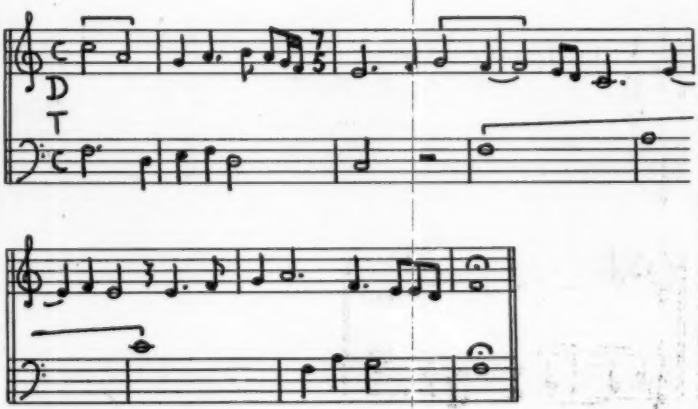

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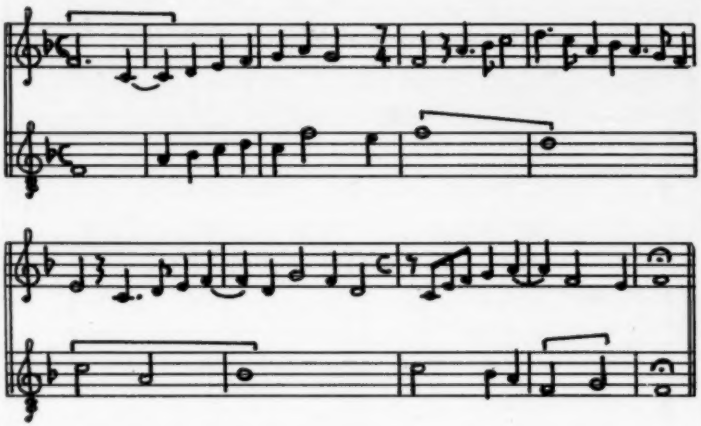
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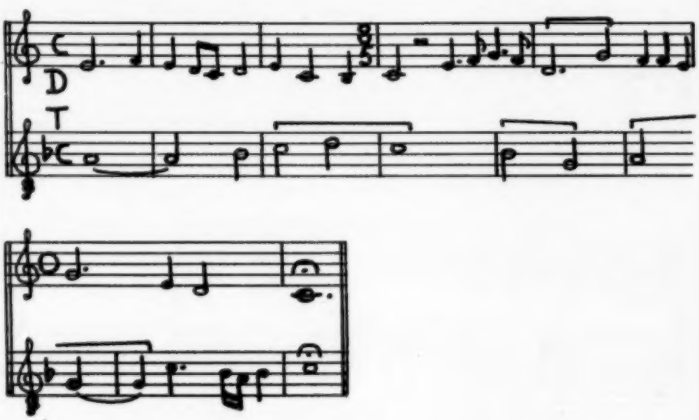

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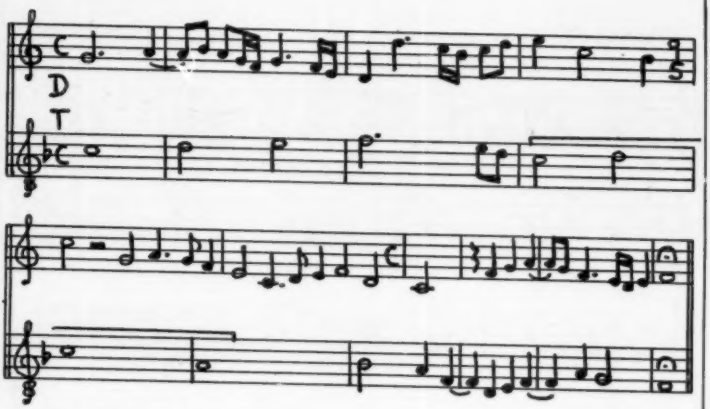
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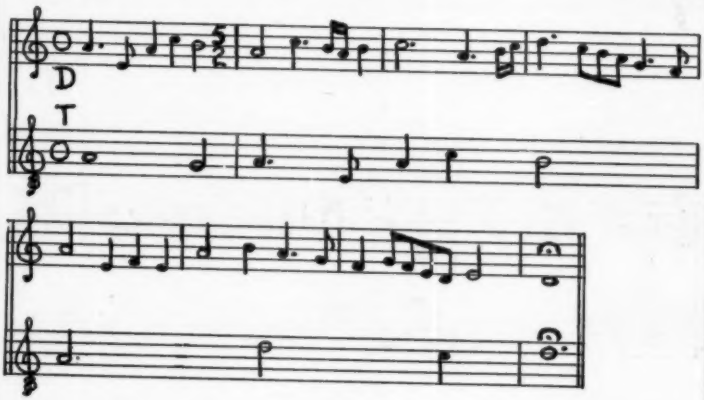
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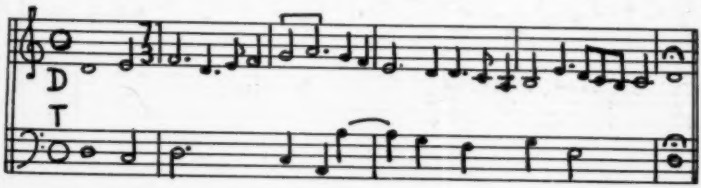
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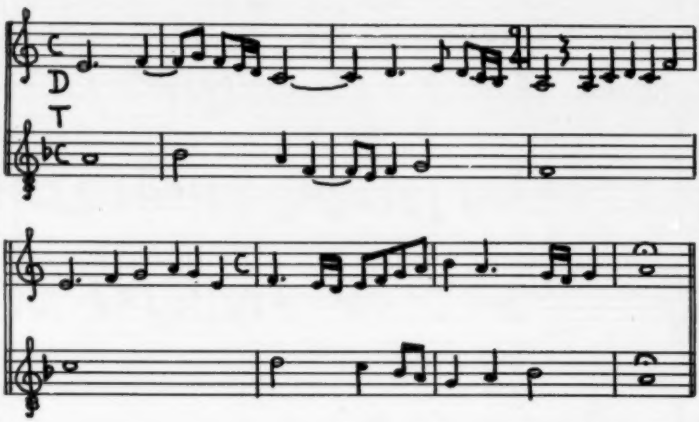

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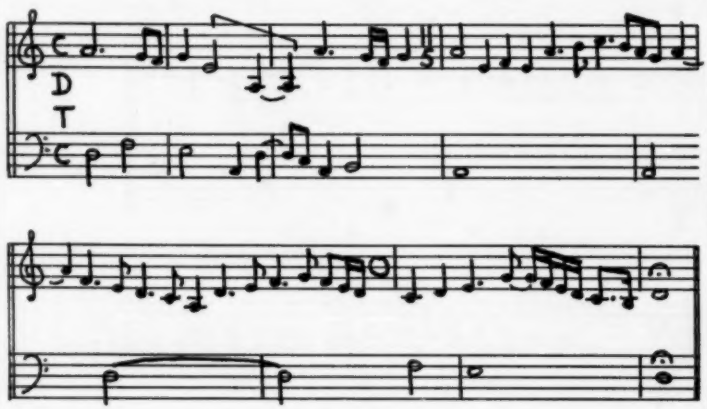

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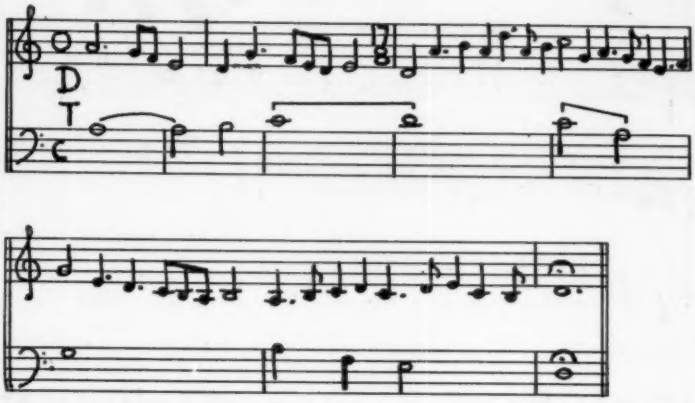
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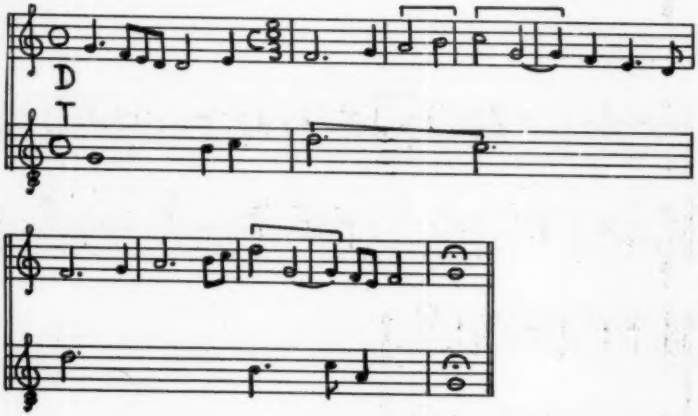
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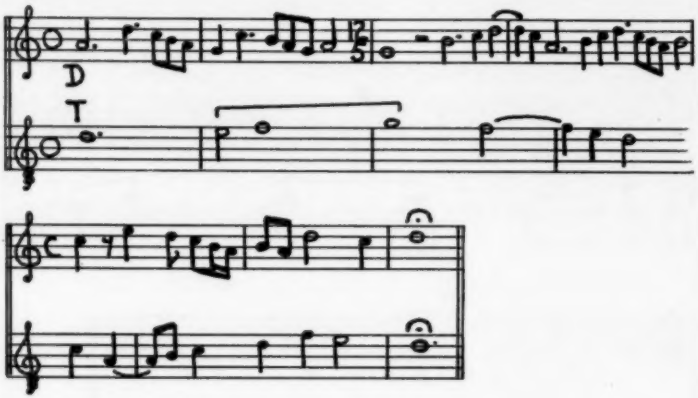
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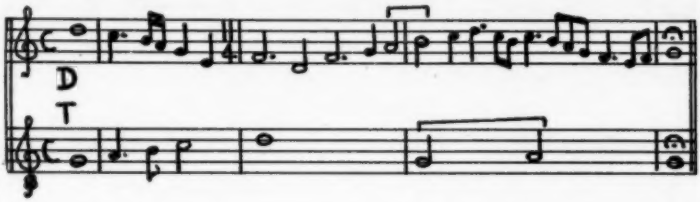
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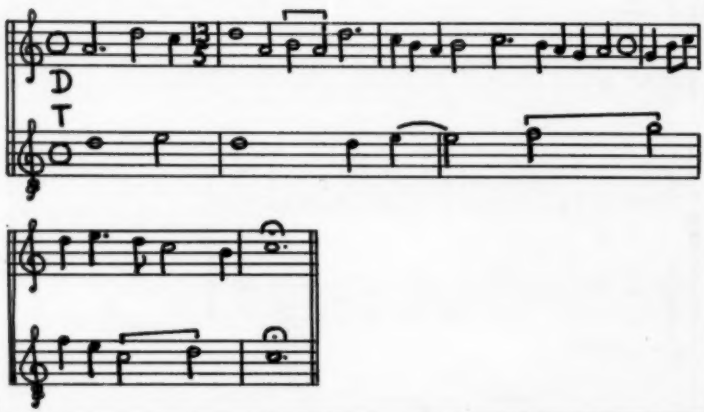
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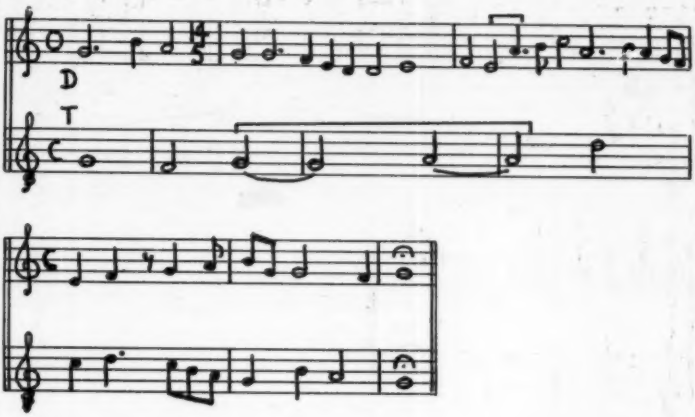
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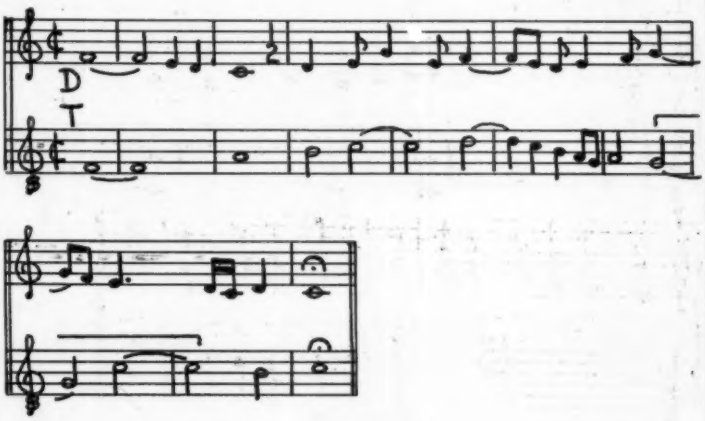
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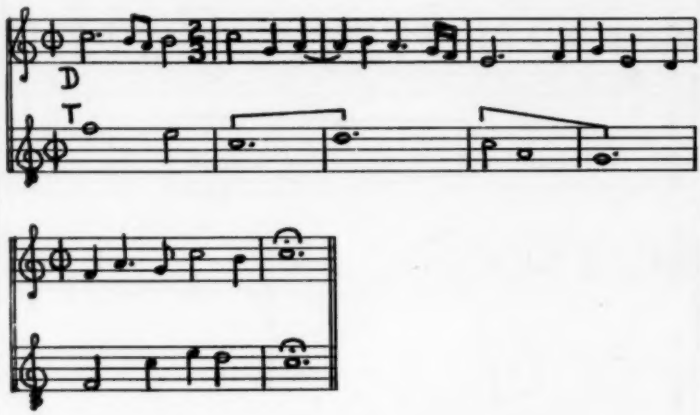
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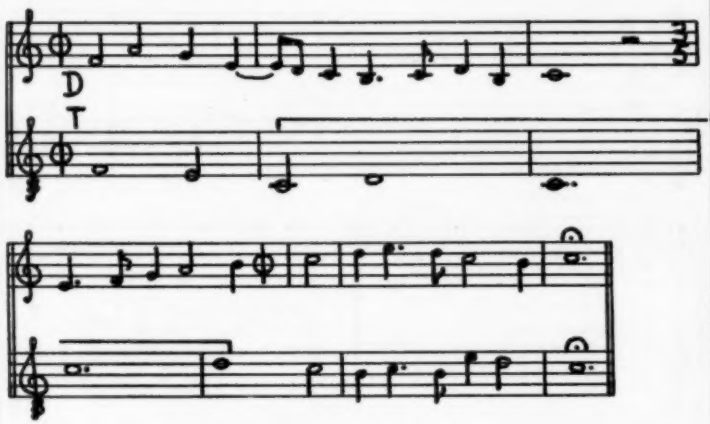
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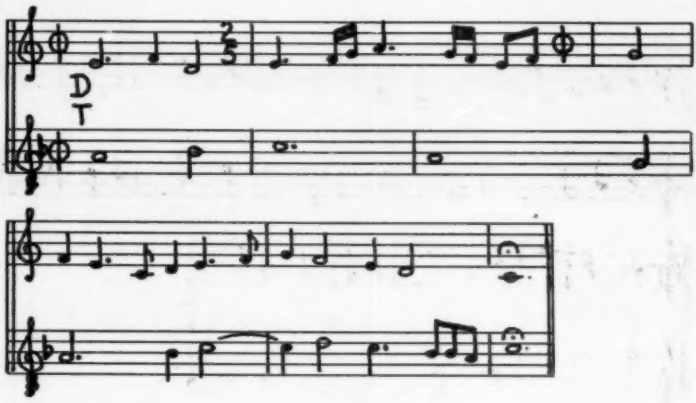

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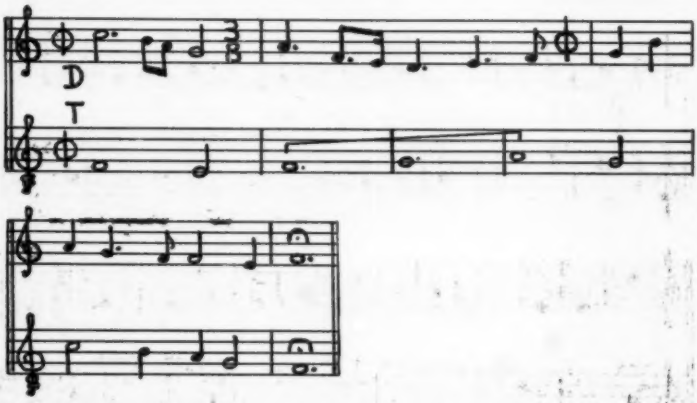
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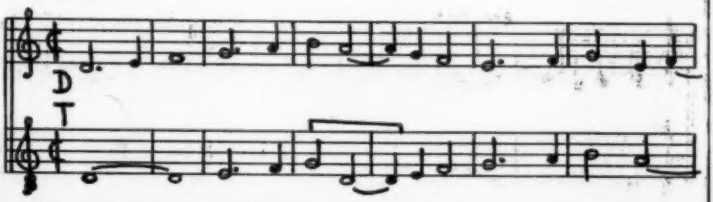
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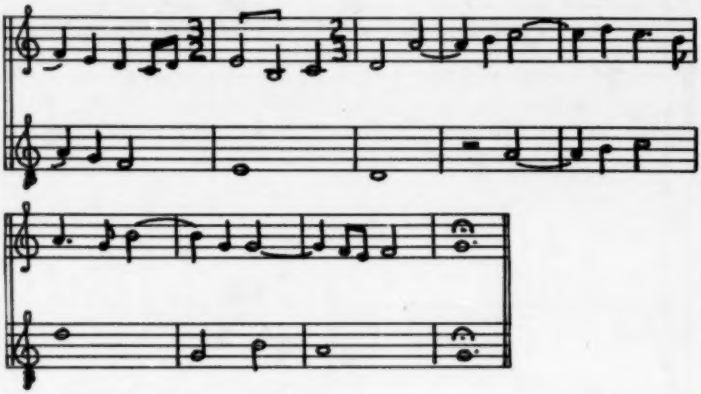
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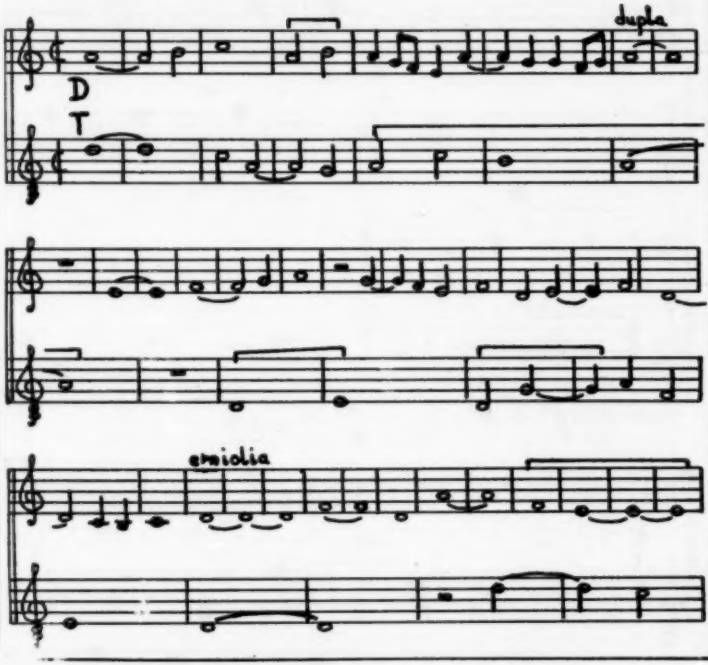
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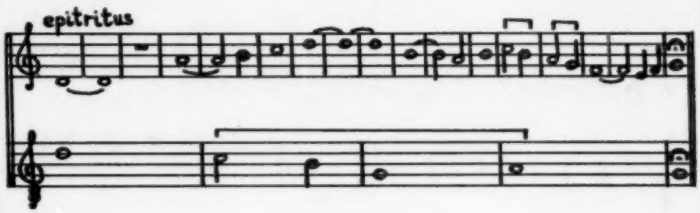

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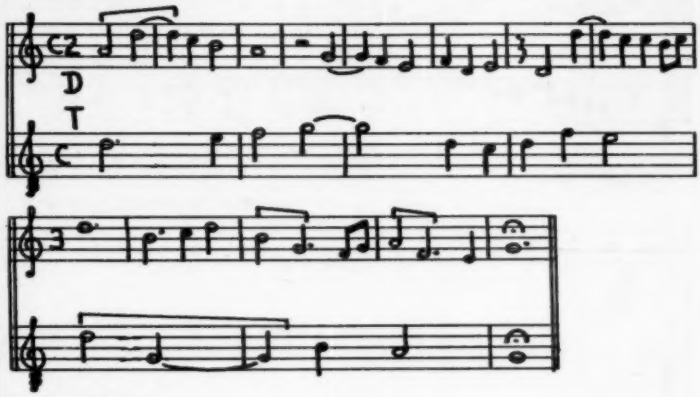
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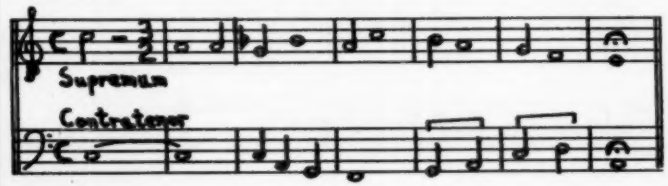
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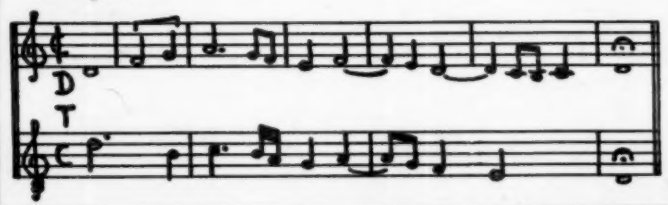
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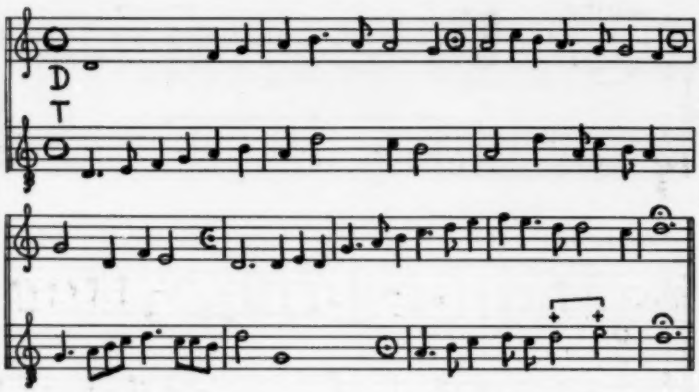

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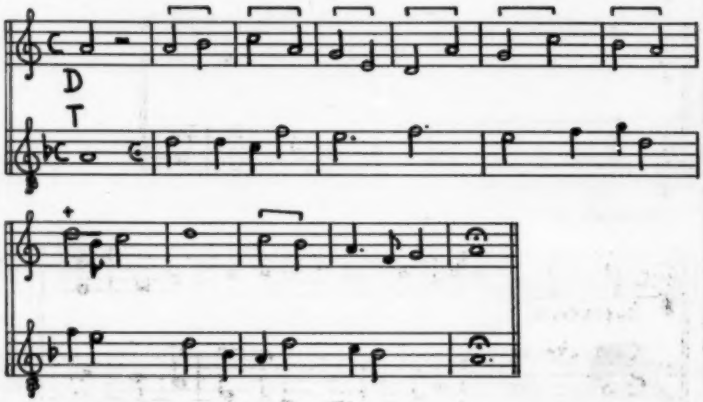
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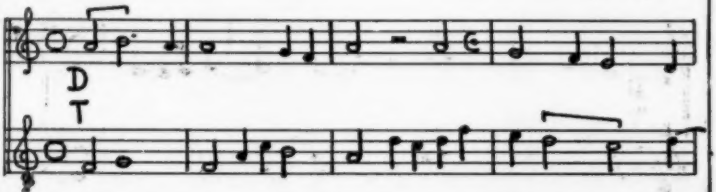
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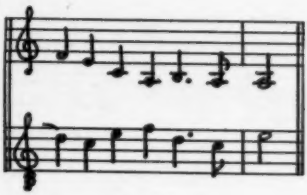

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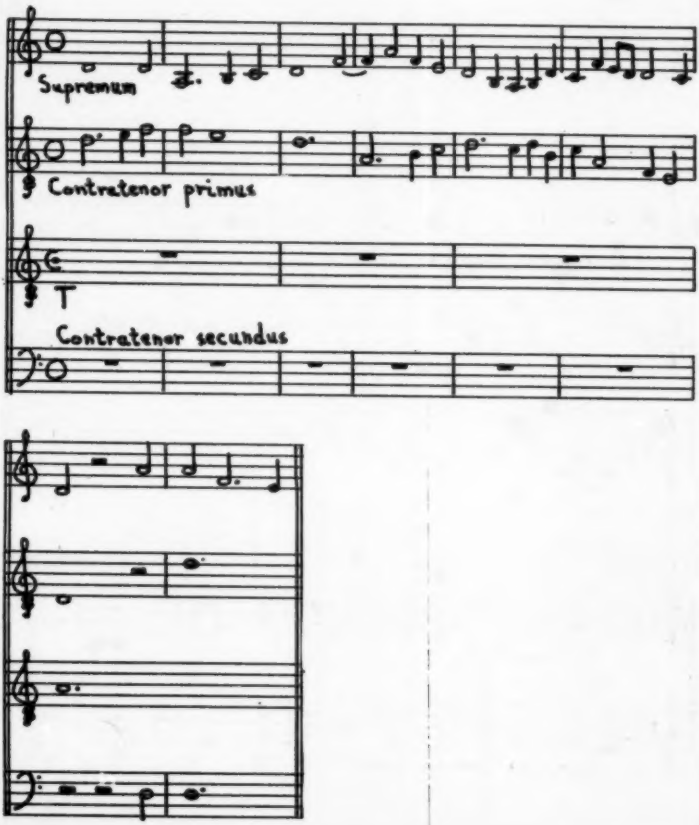
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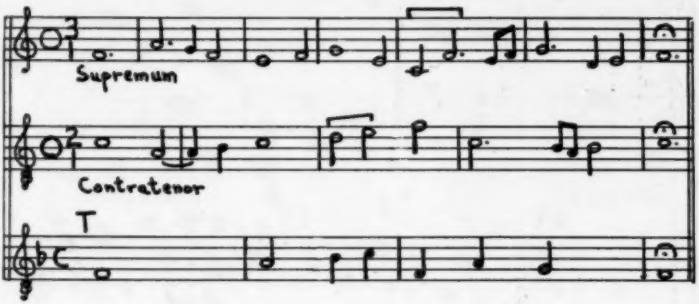

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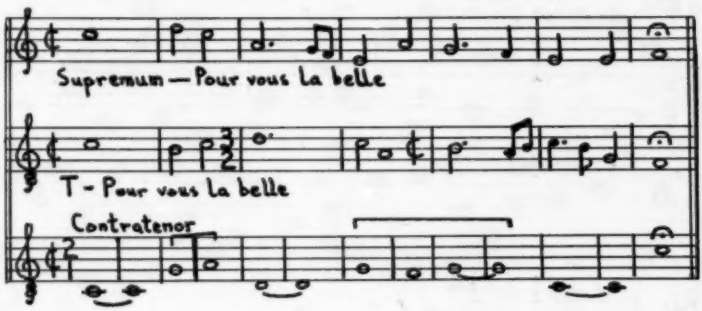
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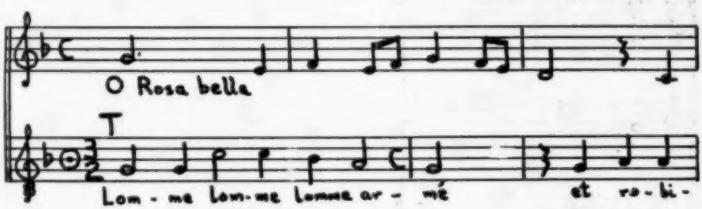

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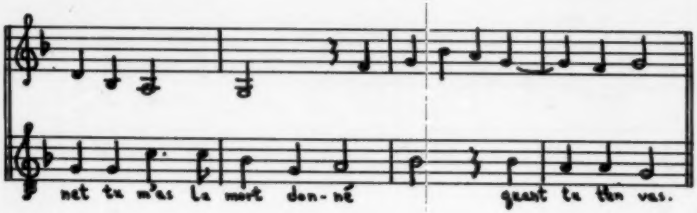

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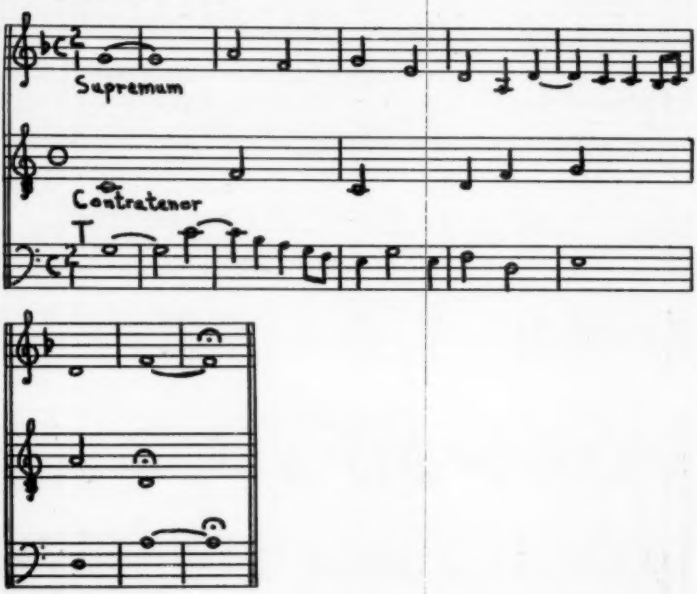
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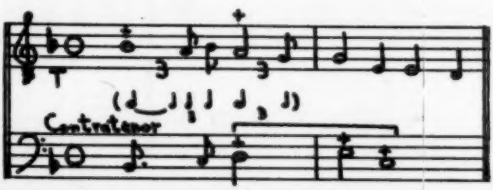
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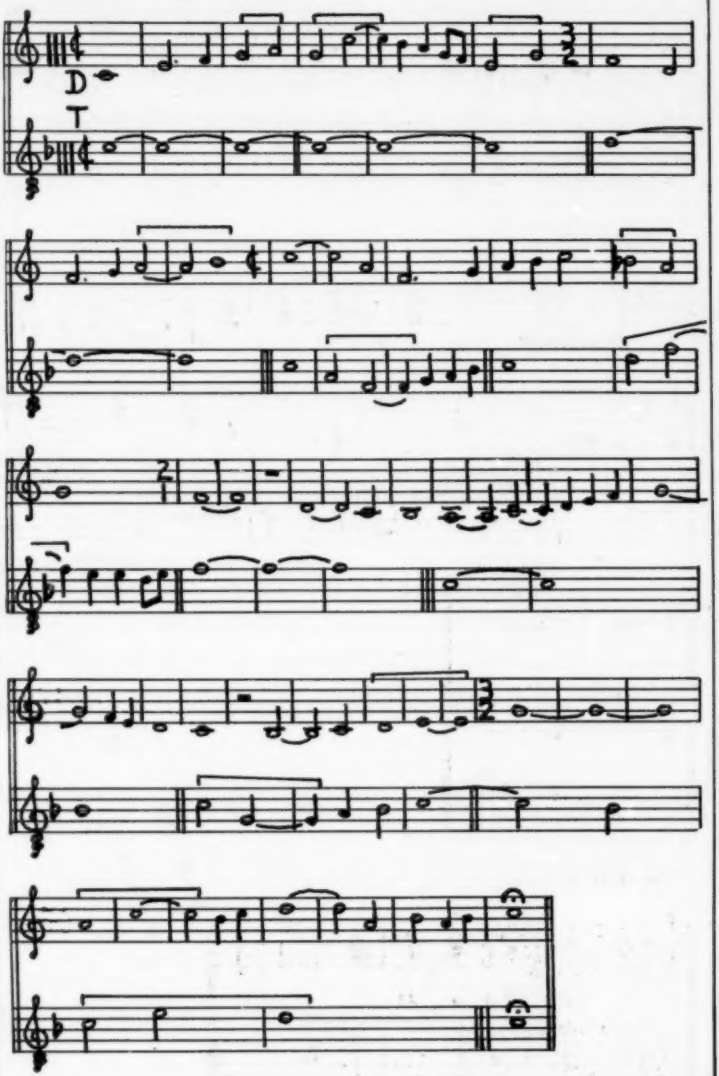
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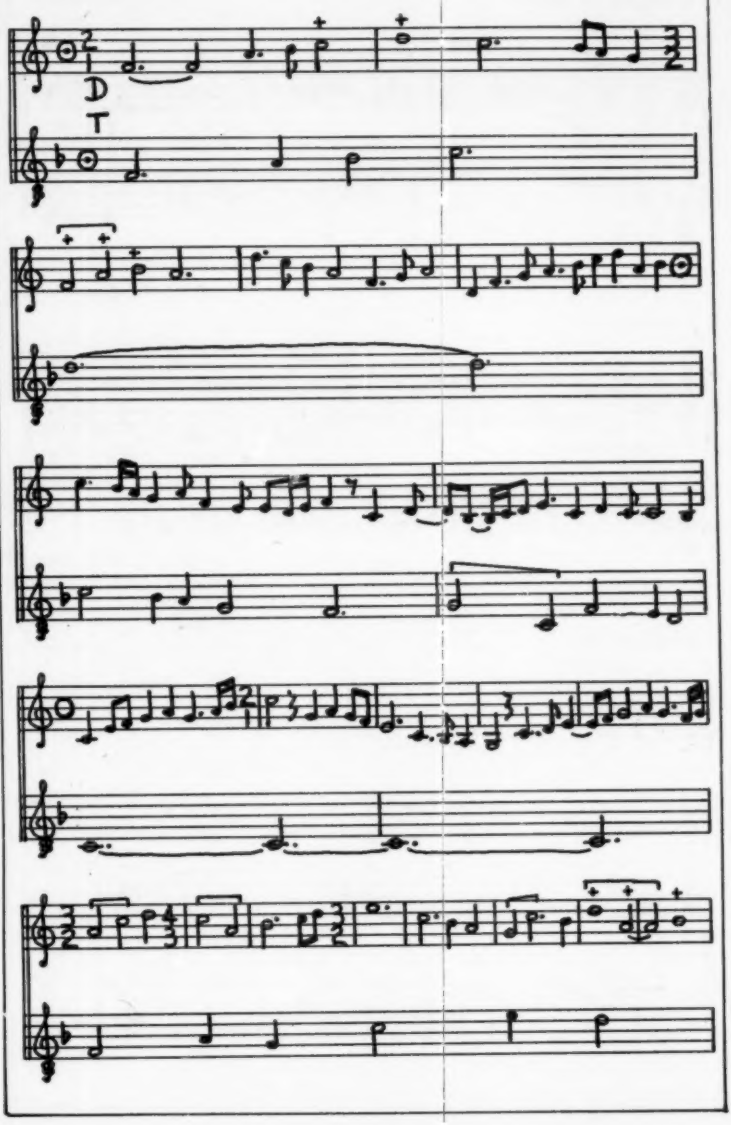
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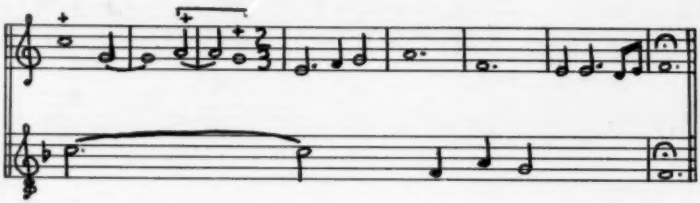
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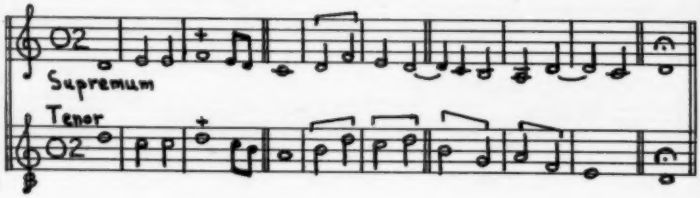
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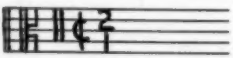

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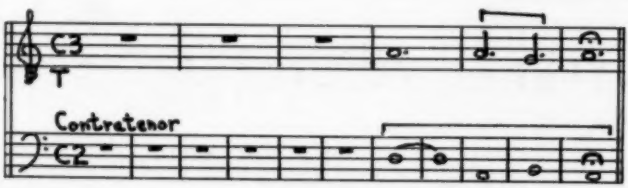
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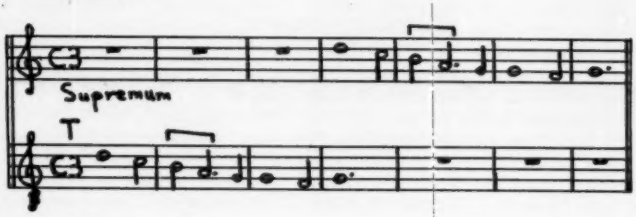

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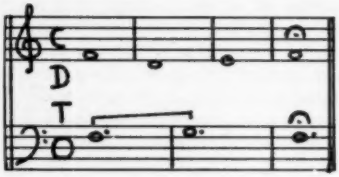
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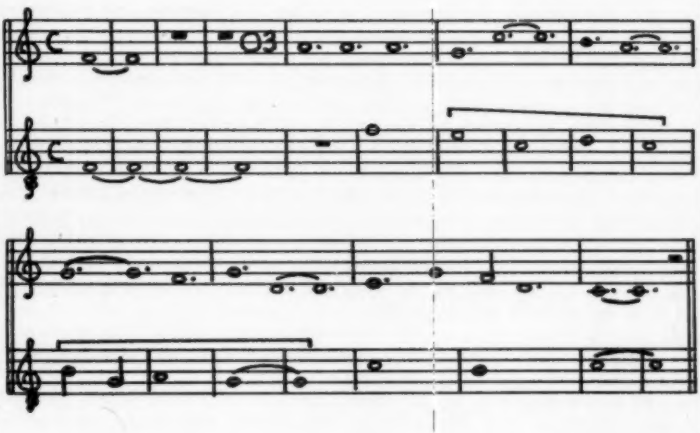
MUSIC READING RECONSIDERED AS A CODE-LEARNING PROBLEM

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This essay is a study in the problems of music-reading and the teaching of music-reading — specifically and only vocal music-reading. We are considering the proposition that teaching of vocal-reading directly from staff-notation (without the expedient of syllables) might be more readily possible than by present methods, if the nature of the problem can be seen sheared of many elements which commonly confuse thinking about it. We propose in particular to examine the use of music-notation as a communication process parallel and in many respects analogous to that of written language, but to reconsider this oft-remarked analogy, looking on written language and music notation side by side as types of code, in the teaching of which a large part of the problems arise from inherent ambiguities in the relation between written symbol and what is thereby encoded. We present an analysis of the writing and reading of both language and music as encoding-decoding processes, and the parallel but somewhat different problems raised by the necessity of dealing with those inherent ambiguities. We will derive from this analysis the suggestion that methods parallel to some which have proved successful in developing language-literacy might be used in developing music-literacy also.

It will be necessary in the course of the discussion to recall many facts which to any member of the profession will perhaps have the flavor of irritating obviousness, in order to rephrase and re-evaluate them in the terms of our analysis. We will need to assume the reader's patient awareness that the attempt to get a fresh view of fundamental problems often calls for the alignment of facts well-known in order to see in them a configuration previously unnoticed or insufficiently regarded. The light we hope to cast on the familiar facts may have only a slightly different slant, but we believe that its shadow, like the lines in the spectrum, may offer a hint of possibilities worth investigating further. To make the full optimistic leap into theoretical possibilities, we believe that from the viewpoint here presented there is revealed a path which, followed with sufficient imagination, conceivably might lead to attainment of a far greater degree of music literacy among average school pupils, and hence among the general population, than has been so far thought within reach.

To put this proposal into perspective it is worth reflecting on how recently in history the idea of universal language literacy has been subject to entertainment; yet at what a phenomenal rate, since common-school education (all reservations admitted), that ideal has been approached. It may appear nevertheless an excess of professional enthusiasm to conceive the possibility of an even remotely comparable music literacy. However, a profession whose practitioners acclaim the slogan, "Music for every child, every child for music," cannot, in

an age when reputable scientists spend serious research on the fairy-tale possibility of trips to the moon, neglect any trail which might lead closer to making their ideal musical culture also a musically literate one. We are exploring only the theoretical basis of the pedagogical problem which the attainment of that ideal would present. We are attempting to delineate only general principles and such practical devices as will support the contention that the principles might be implemented. But the idea of practical execution of such a program on the principles here discussed offers a challenge to the imagination as well as to the practical ingenuity of anyone to whom music and teaching and the dream of a both musical and musically literate society are important preoccupations.

Both spoken language and sung music are patterns of sound produced vocally. The pattern of language may be characterized as a series of changes in the quality of sound produced. The pattern of music may be characterized as a series of changes in the pitch and rhythm of the sound produced.

It will be convenient, and clarify the line of thought, to leave aside for the present the aspect of rhythm in the music pattern in order to consider and compare the manner in which communication of changes in quality and pitch of sound (through the respective codes of language and music) is accomplished.

In each case, the encoding process entails breaking up the sound pattern into component units (PHONEMES) each of which is then recorded on paper as a unit of code (GRAPHEME). This is essentially an analytic process. It means that in order to use the code at all, the would-be "encoder" or "decoder" must develop skill in a mode of hearing such that the continuous sound-pattern is apprehended as a series of units corresponding to units available in the code. The sound-pattern of language is then heard as a series of vocally-produced noises of differing quality, each of which is represented by a letter or a group of letters, appearing as a visual series on the page. The sound-pattern of music is heard as a series of melodic interval-relationships, each of which is represented on the page by the relative position of two notes against the staff. The reader, decoding this atomized record, must perform the reverse operation in an attempt to arrive at the original continuity of sound-changes.

The facility with which either of these operations can be performed — the act of encoding or writing, the act of decoding or reading — depends much on two attributes of the code itself. First, how specific is the relation between sound-pattern-units and code-units? In other words, how much ambiguity in the rules of the code do the writer in encoding and the reader in decoding have to deal with? And second, where ambiguity exists, how direct and efficient are the possible means of coping with it and resolving it?

Examination of this relationship in both the case of language and that of music will reveal that, in both, formidable ambiguities exist. In

CODE-UNIT consisting of the single letter below:	MAY REPRESENT SOUND-UNIT or in combination with another letter or letters may represent different sound units, or may be "silent" as in words below:	OR, ON THE OTHER HAND those same sound-units may be encoded by means of different letters or combinations of letters, as in examples below:
B	habit / doubt	BB (rabbit)
C	cat/city/child/chute	CC (account) CK (packet) K (kitten) QU (plaque) CQU (racquet)/ S (sit) SS (miss) / TCH (catch)/ SH (shoot) CI (appreciable)
D	did / walked	DD (add) / T (apt)
F	foot	FF (coffee) FFE (giraffe) PH (physic) GH (cough)
G	wagon / engine rough / weigh / gnaw	GG (wagged) / J (jig) FF (ruff) / Y (way) / N (nor)
H	hat / honor / oh / who	WE (owe)
J	jam	G (gem) DG (wedge)
K	kitten	CK (back) CH (ache) QUE (plaque) etc. (cf. C)
L	let / calm	LL (all) LE (mantle) EL (mantel)
M	him / jam	MN (hymn) MB (jamb)
N	net / hymn	NN (bonnet)
P	pet / physic	PP (apple) / F (fizz)
Q	quick/plaque/racquet	(compare C, CC, K)
R	rat / apparel	WR (wrap) RR (barrel)
S	sit / his / shoot	C (city)/ ZZ (fizz)/CH (chute)
T	take / they / thin	TT (bottle) / TH (Thomas)
W	wave/when/saw/wry	U (suave)
X	lux	CKS (lacks) CS (ecstasy) QUES (plaques)
Y	yes/bray/rhythm/rhyme	E (brae) / I (with) (rime)
Z	zip / azure	ZZ (jazz) S (has) / S (pleasure)

neither case do the two sets of units — those of the sound-pattern series and those of the code-unit series — have a one-to-one correspondence. It is this discrepancy, a discrepancy which raises great problems in teaching the reading of either language or music, which we will analyze more closely, first in the language code, and then in the music code.

We start on familiar ground. It is commonly remarked that words in English are not spelled very systematically. Any given sound may have several different encodifications (e.g. fir; cur; per). The reason why English-speaking children have to spend so much school time on spelling becomes very evident if one starts listing some of the ambiguities: the various different phonemes which the same symbol may represent and, on the other hand, the various other encodings in which the same phoneme may appear. We list below some of the ambiguities that are involved in the consonants in English. The letter C, for example, may represent, or help represent, the entirely different sounds which begin the words CAT, CITY, CHILDREN or CHUTE. On the other hand, the sound encoded at the beginning of CAT by the letter C turns up encoded quite variously and otherwise in the words ACCOUNT, (CC), PACKET (CK), KITTEN (K), PLAQUE (QU) and RACQUET (CQU); the one at the beginning of CITY turns up in SIT (S) and MISS (SS); the one in CHUTE turns up in SHOOT (SH) and APPRECIABLE (CI).

The listing on page 78 does not pretend to be exhaustive, and any reader may have other such examples of ambiguity to add. A similar list for the vowel-symbols would be enormous.

The ultimate in decoder's dizziness is well illustrated in the famous verses:

> There once was a man with a cough
> Who said to himself that although
> His life was not tough
> He knew he was through.
> So he stabbed himself with a plough.

Such is the ambiguity of the code that anyone must use to write the sound-patterns of English, or to read them. With such a vehicle for writing down the vocalizations of our reason, how does any child learn to read, or anyone succeed in teaching him? And, in particular, how does one begin with a child to whom this is all strange? Should he be taught to respond with a certain sound for each letter, as some over-enthusiastic advocates of the "phonics" approach naively insist, so that he may "sound out" the words? Montessori did this, and in Italian, an almost completely phonetic language, her nursery-age children did succeed in arriving at the sound of the words. English has traps for this procedure. Suppose a child learns C as the sound appearing in the word CAT. What happens when he meets the word CHILD? or the word CITY? Or should he be taught all the alternatives (with or without rules for choice) which in each case he must go through for each word he meets, till he arrives at the right one? And how does he know which is the right alternative? Montessori found that when her children succeeded

in arriving at the right sounds — in Italian where they had very little ambiguity to surmount — they did not recognize the words, which they "read" so fluently, as meaning anything. All their energy had been spent in deciphering and assembling, out of individual phonemes, the word-pattern.

But enough to illustrate. We are not yet concerned with teaching-method. Suffice it to note that in every case of ambiguity in the code-unit of language, the ambiguity must be resolved by reference to a larger pattern or context in the process of decoding. It may be just the next letter that must be taken into account, for there may be a fairly dependable rule of association, as when the letter C is consistently affected by the ensuing vowel (CA, CO, CU as against CI and CE). But, to use the same example, when C appears in the context CH the reference must go further. The combination may indicate the sound in CHILDREN and CHUCK, or it may be as in CHUTE. Only reference to the whole word and the knowledge of that word as a specific fact can settle the matter. In some cases the context of the word, or even of the whole sentence, is not sufficient. How do you say the sentence "I READ THE BOOK"? You need to know whether it is TODAY or YESTERDAY to be sure of the sounds signified by READ. When there is in the context some reference to time, then all the habits of usage, the association in spoken language of one or the other word-sound, can settle the matter for you.

In decoding written language-sounds, all these references must be made constantly to the rest of the visual context and to a wide range of experiences with language — usage in spoken language, learned facts of spelling usage — some few systematic but many without system, merely learned as unique facts. One just has to have learned them, and even the best-informed have recourse to dictionaries, where the total context of language-usage is recorded to make the reference possible.

Now compare the code problem presented by music notation to the average person who would learn to arrive at the patterns of sung music thereby. It is necessary to emphasize the average person and the fact that our concern is sung music, and to suppress rigorously the tendency to identify notation with instruments, because in the difference between the average voice and the man-made instrument lies the heart of this problem. Speaking metaphorically but no less truly, the man-made instrument has a built-in memory for absolute pitch (let's not quibble about effects of weather) whereas the average human does not. Yet our notation, whose course of development in the last three centuries has been dominated by the needs of instruments, specifies musical sounds in terms of some definite "absolute" pitch. The fact is apt to mislead us into assuming the single note as the unit of the music code, which it is not.

Looked on as a unit of code, the single note on a staff indicates unambiguously what must happen — on the piano. But this is a mechanical operation, not a musical one, and can be done without reference to sound at all on the part of the "reader". And this is generally

true of the instrumental staff-code, which, like the tabulature used for fretted instruments, can be used to an extent on most instruments without any reference to sound on the part of the user. The notation, though it may have represented a series of sounds with certain pitch in the mind of the encoder, may be interpreted by the decoder as a series of mechanical operations which, if carried out correctly, will produce an approximation of the sound-pattern conceived by him who wrote it.

On the other hand, the average tune-carrying singer, faced with the code-symbol for A-440, not having in his "built-in" instrument (ear-cum-voice) a "built-in" absolute tuning (only a negligible number of people seem to) receives therefrom no such directly usable communication. Even the piano-tuner carries around with him a tuning-fork to "remember" that tone by. And, without reference to some such mechanical "memory", a singer who wished to encode a tune he just conceived is incapable of specifying the absolute pitch of the sound-pattern as he hears it. Indeed of course it does not matter. Whether another singer, decoding his notation, reproduces the communicated tune at the same absolute-pitch level is entirely irrelevant. [1] It is the relationship between the tones that is all-important. Obviously, then, the unit of communication for the singer cannot be conceived as the single pitch-specified note. This is not the "phoneme" of music.

If it is not that, what is it then? Although one musician, having conceived a tune, cannot without reference to a mechanical memory specify the absolute pitch of the individual tones as he hears them in his mind or as he sings them, he can still encode that tune. And another singer can decode it and sing it too, and everyone would be agreed that it was the same song, although the individual tones sung were identical in absolute pitch at no point whatsoever. As it concerns the average tune-carrying singer whose reading problem we are discussing, we are forced to conceive the sound-pattern unit not as the individual note but as the melodic interval, symbolized in notation-code by the relative position of two notes against the staff. In other words, the sung interval is the "phoneme" of music. The written interval is the "grapheme" of music. And in encoding and decoding, the analysis of the melodic line must take place in terms of intervals, and the representation must be in terms of intervals.

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1. We are aware of the problem involved in what professional singers refer to as "tessitura", the advisability of "getting the song in the comfortable middle range" of the voice. This arises at the professional level because the soloist, once embarked on a song, can meet trouble if the instrumental "key" of the accompaniment was ill chosen. For the average tune-carrying singer who is the subject of our consideration there is no such problem. Unhampered by accompaniment, when he strikes up a tune and finds it getting out of range, he merely starts again at a more comfortable level. Anyone leading community groups, campfire singing, or children in a classroom, quickly learns to "pitch" a songtune in the middle of the average voice, ignoring whatever the book may say. And the other singers get oriented to tonic and just sing, thinking nothing of "key".

In truth, the staff — that simple device which is a kind of pictorial metaphor and a kind of graph wherein "up and down" on paper is equated with "up and down" in pitch, the lines serving as measure of the melody's fluctuation as the lines on a thermograph register temperature — the staff has never been used and cannot be used without some means of further specification. The earliest use of a line as a reference-level for the pictured indication of "melodic altitude" was always accompanied (so far as the present writer has ascertained) by a label for that line such as a letter C or F, which specified for that line and hence for every other a position in the diatonic order. In other words, already there were inter-related two code systems, one visual (notes or neumes against staff) and another purely and abstractly symbolic, the letter code. This latter, though it had not yet become enchained by standardized instruments to an absolute-pitch reference, was necessary so that the reader might be referred to his orientation in the theoretical concept of the diatonic system as a means of resolving ambiguities left by the graphic picture-code.

Vocal readers now, as then, are forced to use the letter-reference to make that orientation. Each successive tone sung must be referred not only to the previous tone but to a total order of tones, a patterning of tones according to usage in the present-day common experience around a tonal center. (Twelve-tone enthusiasts reserve protest — we are discussing common experience.) The tonal center, identified with a specific staff-location at the beginning, held in mind during the entire decoding procedure and thereby implying an entire set of working relationships for the rest of the staff-picture, is the point of reference by which the ambiguities in the visual code are resolved. Note that once this main point of reference is made and the tonal-center orientation evoked, the visual picture-code becomes specific in its ultimate reference to usage.

Here is the ambiguity in the working of staff-notation — that is, the representation of melodic intervals by a succession of notes on staff — as a type of code. The representation on the staff of any interval except the octave may be interpreted in either of two ways: thirds, sixths, seconds and sevenths may be major or minor; fourths may be perfect or augmented; fifths may be perfect or diminished. It is only when the staff-code representation of an interval is referred to something beyond the staff-code — the tonic-location and all its implications of traditional usage — that the ambiguity may be resolved.

Without such reference, the grapheme of an interval is doubly ambiguous. Not only does the reader not know, for example, whether the encoded fourth should be perfect or augmented but, should he read it correctly as the progression of a perfect fourth, there still remains to be settled the implications of that progression. The progression of a perfect fourth from dominant to tonic and the similar progression from tonic to subdominant involve an entirely different set of "expectations" — the intangible aura of "quality" which is a component of the "meaning" of music, and which becomes more specifically defined by the sense of its relation to a tonic-center.

A further present-day complication of the code lies in that the location of this all-important general reference-level is hidden behind the many faces of the instrumental transposition-code. For any ordinary tune-carrying singer without absolute-pitch reference this represents purely logical confusion, another and third code complication to be deciphered in order to find his point of reference for ambiguity-resolution. For does the average song-loving citizen hear a flat on the fourth degree when he sings "America" in what the pianist's notation would tell him is "the key of F"? Would it make any difference if the score before him differed from that of the pianist by being "in the key of G" telling him that the seventh degree is "F sharp", a fact that has no reality in either his vocal or audial experience? These are logical considerations only, imposed on his reading procedure by the instrumental notation which may present to his eye, in the guise of many different graphemes, what he must through these many purely logical complexities interpret in each case as the same phoneme — a simple and quite familiar relationship of two successive tones oriented in the diatonic tonal system.

This is of course why it became common early in Western music to train singers not only with staff-code but with yet another code consisting of a set of nonsense syllables each assigned arbitrarily to a position in the diatonic order and therefore symbolizing a tone in a specific relation not to a "key" (which the singer does not and cannot experience) but to a tonic (which he can and does). Lacking the pictorial concreteness of the staff-code, this did at least serve as a single reference-system to resolve the ambiguities of the staff-code. Before the latter became cluttered with the effects of the instrumental transposition-code it probably helped singers, as it still does in some cases, transcend the multiple ambiguities of interval-relationship as indicated in the staff-picture. Actually, when used alone, it is a single code specific for singers' needs, and so efficient did it become, in a form developed in latter-nineteenth-century England for use independent of staff, that it made possible an immense growth of vocal-reading choirs. A similar facility was developed, we are told, in those American groups using a similar device linked with the use of shape-notes. But the course of history relegated the latter development to a regional eccentricity and revealed the weakness of the Tonic-sol-fa — that, being unassociated with notation, it did not relate to other musical experience or necessarily lead to mastery of staff-notation, which command must be, it would seem, the possible goal, however distant, which any elementary music-training should, if not lead to, at least not obscure.

Some singers, having been introduced to some form of syllables, succeed in learning to read staff-notation with the help of the syllables, which are then abandoned. But this is not a common enough success to recommend the procedure. American teaching procedures in the present day, attempting to utilize a syllable (or number) code thus as a way-station to notation-reading, succeed in great degree only in creating further confusion in the minds of many would be readers. They become lost in the confusion of four codes: the pictorial staff-code, the letter-code, the superimposed transposition-code of sharps and flats and signatures, and the further code of syllables or numbers or even both

which the teacher hopes will bring order out of the chaos. They fail nevertheless in large numbers to find in all this an evident and readable encodification of the musical patterns the audial reality of which they may all the time be vividly aware.

In attempting to teach pupils to cope with the ambiguities of staff-notation code, is it necessary to introduce further ambiguity problems by this multiplication of codes? Perhaps we should take a fresh look and ask ourselves what is the least a singer needs to know to resolve the ambiguities of staff-notation code. And by what means could we introduce pupils to notation in such a way that they would be prepared to meet and solve the ambiguity problem.

Teachers of language-reading must prepare their pupils to cope with ambiguities at least as formidable as these. We might examine their methods for a clue to more effective teaching of music code.

Learning to read written language is a process of developing an association of the written code-patterns with the already fully established vocal sound-patterns, an association so strong and complete that the pattern of the written code will promptly and accurately and dependably evoke the previously-known word-pattern.

The vocal patterns are of course taken for granted as an established and habitual skill. It is the problem in teaching reading to arrange matters so that the association of unfamiliar written symbol-patterns with the already familiar spoken language-patterns will take place in the pupil's mind. More than that, the association must take place sufficiently often and under circumstances sufficiently interesting and rewarding to the pupil that it becomes habitual — it becomes drilled to the point of mastered skill.

A basic problem in teaching procedure, as we have emphasized earlier, arises from the ambiguous relationship between phoneme and grapheme — between sound-pattern unit and written code-unit. Since this is not a one-to-one relationship it is not possible simply to drill the pupil in responses to letters as phonetic units. The teacher is faced with an apparent impasse; only the context of words and meanings determines which of several possible sounds is represented on any specific occasion by the written code-symbol. Correct response to individual graphemes must be arrived at through correct response to larger patterns of graphemes, total words and their meanings. The pupil cannot begin to learn decoding until he can ... eady get meaning from the printed page, for until he can already get meaning he has no means of resolving the ambiguities of the written code. Communication of meaning through the printed word must somehow be established before insight into the code, with all its ambiguities, can begin to develop.

Teachers of language reading have therefore sought a way of enabling pupils to get meanings out of larger grapheme patterns — that is, out of printed words — first of all, sidestepping for awhile the need

for facing the problem of code ambiguities. Their solution is a simple one. The pupil is taught the first hundred or so printed words as if they, as wholes, were the units of code, corresponding to the spoken words which he knows as the units of spoken language. By the device of picture-illustration he is enabled to "read" them right away, and he is given practice in this until he can recognize the words of this beginning vocabulary on sight.

To put this into technical language: Vocal response to unanalysed orthographic word-patterns is first elicited by direct association methods. The orthographic pattern of a word with strong meaning-associations is presented in a visual non-orthographic context (the picture-illustration) calculated to elicit the vocal response appropriate to the printed word, with which it is thereby associated. For example, the child is presented with a picture of "Mother" in a dramatic situation. The word MOTHER is printed below the picture. The picture elicits the spoken word "Mother" which the pupil thus associates with the printed grapheme-pattern he sees. A series of pictures of "Mother" accompanied always by the orthographic pattern MOTHER will prepare the child to make the vocal response later to the printed word MOTHER in the absence of the picture and without prompting from the teacher.

This basic vocabulary of words which he can recognize as whole patterns serves two purposes in the ensuing procedure. First, it gives a body of working materials which he can then learn to examine more closely, the word-sounds with his ears, the printed word-patterns with his eyes, acquiring the skills which we have referred to as analytical hearing and seeing. He learns to perceive in the spoken and heard words some of the phonemes out of which the whole spoken word-pattern is made up, and to see in the printed word-pattern some of the graphemes out of which the whole printed word-pattern is made up, so that he may learn to relate and associate the two. Second, it gives him a small working vocabulary of encoded words which can function as a meaning-context for resolving the ambiguity in the grapheme-phoneme relationship when he meets it.

The words of this beginning vocabulary (sometimes called the "recognition-response" vocabulary) are, as they are learned, arranged into small phrases of different syntactical patterns: "Run, Mother"; "Run, Tom"; "Run, Father, run"; "Run fast, Tom"; "See Tom run"; "See Father run fast"; etc. Thus the words are practiced and drilled. Such little phrase-patterns are the syntactical patterns whereby the English language indicates action, and so they can also be illustrated by pictures to supply a context for sure recognition as they are practiced. Moreover, these little structural "frames" of the language offer a new tool for identification of new words as they are introduced. Not only do the known words help narrow down the possible meaning of any new word that may appear, but from its position in the syntactical "frame" the child knows what <u>kind</u> of word it is that he is trying to identify. There are now three sources of clues for identification of new words: the picture-illustration, the meaning of the surrounding known words, and the syntactical position of the new one. Thus the recognition-vocabulary is built up, by measurable degrees.

These last two types of clues to meaning — the context of surrounding known words and the syntactical position of the unknown one — are adult tools of reading. These are ways any of us arrive at the meaning of new words when we meet them in reading. With these tools at his disposal the pupil is ready to be faced with the problem of the code — the phoneme-grapheme ambiguity.

Even while in his reading he is responding to words-as-a-whole in context-as-a-whole, he has been given practice in comparing the sounds of words to see what they have in common and wherein they differ, and in similarly comparing their appearance in printed form. This perception-training is partly oral -- planned classroom activities in addition to the reading text; and partly "written"[2] — workbook assignments which the child can do independently. He is taught to focus his attention first on those parts of words that present themselves most clearly to consciousness, i.e. beginning sounds and rhyming endings. Similarities in sound are associated with similarities in appearance, and he begins to form (in practice, of course) such a generalization as that, for example, the words TOM, TOYS, and TABLE all begin with the same sound and the same letter (later to be called T) whereas APPLE and BALL do not. When he sees a new word with that same initial letter he will now have a new clue to its sound which, with further context clues, may establish its identity.

Such comparisons, analysis, generalized perceptions and association of phoneme and grapheme are brought about by having the reading material so planned that, in reading, the pupil is faced by dilemmas in which a choice of word has to be made under circumstances where the picture context, the surrounding words and the syntactical position of the new one do not entirely resolve the question and the pupil is therefore forced to look at the orthograph more closely than heretofore. Similar dilemmas face him in the supporting workbook practice. There "puzzle" problems (children love puzzles) force his attention on different aspects of the sound of words or the appearance of orthographs bringing him to a closer focus of attention on phoneme or grapheme as the puzzle-dilemma demands. All this makes him more ready to relate phoneme and grapheme in his reading.[3]

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2. "Written", only of course in the broadest sense. The standard type is a multiple choice problem, with correct answer to be indicated with an underlining, crossing out of the wrong alternative, or some matching indication. Actual writing of words comes only later, when that skill has been developed.

3. Some years ago, in the enthusiasm of realizing that what a child must get out of printed material is "meanings", the "recognition-reading" technique, newly developed, was carried to some extremes, to the neglect of code-analysis or "phonics" training. It was sometimes thought that reading-training could be carried the whole way with "recognition" of words alone, since words are the "meaning-bearers" of language. The procedure was tantamount to learning a written language like the Chinese, where each word or idea has its own unique ideograph. Some enthusiasts went so far as a "sentence method", reasoning that the sentence was the "unit of thought." This kind of

Smooth progress demands that the dilemma-situations introduced into the material should never disturb the original facility of reading-response, but that the solution of each such problem should increase the discrimination in some degree. And herein lies the problem for those who plan materials and procedures. The material must be so planned that at each point the accumulated experience of the pupil is carefully evaluated, the kind of clues by which he must arrive at correct reading are carefully calculated, so that he will be gradually forced to use orthographic clues and more discriminating perception, while at the same time and at the same rate being enabled to do so. The burden thus rests on the plan of the materials which are supplied to the teacher, whose responsibility rests in understanding execution of the planned program.

The teacher's part will entail what has been called "conjuring up a suitable mental background" in classroom activities related to the material: discussion and conversation and exchange of story-telling in class, so that the children are all in general thinking about the same general background of things and activities. In this atmosphere, the child meets an unknown symbol-pattern in the book. Clues in the picture, the word context and the syntax leave the significance of the strange grapheme-pattern in some doubt, but the new clues which he has begun to notice in the orthographic pattern now come to his aid. He has discovered a new tool for reading and been put into a position where he can find it useful. His reading skill is advanced one step.

Thus he learns significant similarities and differences — classes of words, classes of sounds, classes of symbols — and builds up his generalized skill and knowledge of the code. Each discrimination adds one more reinforcement to his ability to cope with the code without dependence on a supplementary non-orthographic context and with more skill in handling the ambiguities of phoneme-grapheme relationship. Each association between concept, word-sound and symbol on the page

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thinking led to neglect of the code-aspect of written language, and may be a cause of much of the inadequate reading currently under criticism in colleges, and a source of the current controversy. It may be well to acknowledge our awareness here of the fact that methods of teaching reading in public schools are at present the subject of much controversy. Obviously, we believe the theory and materials as we are describing them to be valid, and, when used as intended by their authors, effective. The present analysis, while of course in our own terms, is based principally on study of the Ginn Basic Readers series by David H. Russell and others. Any materials and any method can be misused by teachers who feel they must "adapt" it to conform with misguided notions of their own, or who are insufficiently conscientious to study and understand the procedure which they are clumsily attempting to administer. This might suggest that anyone who is critical of the results of any language program in a particular locality should give careful study to the texts and teacher's manuals in use in that particular school system to ascertain precisely where responsibility lies. A lot of such criticism, observation leads us to conclude, is simply misinformed and unjust.

gives him so much more assurance of correct response to any unknown he may meet in his reading material and brings him closer to the point where he will be able to use the specific phoneme-grapheme relationship as a major tool of reading, where "sounding-out" words will be a means to decoding and learning.

Never entirely, of course, for that is not possible. The ambiguities of the phoneme-grapheme code force all of us to read to a great extent with reference to context. We know the odds, the likelihood that the word should sound and mean thus-and-so, even though we have not met it before, because we refer to a great background of experience with language-forms and language-usage when we read. This is what children are doing and being trained to do throughout the learning process. They are interpreting on the basis of the odds in favor of one response against another, though this is as unconscious as any daily habitual action. To help the pupil develop the ability to make accurate choices, the teaching materials and methods must be calculated with consideration of the frequencies in the language of any one or another alternative whenever we face him with any of the ambiguity-situations inherent in the code. He is eventually prepared with all the alternative responses, between which the context enables him to choose the right one for any occasion.

For example, the letter C may appear in his sight-recognition vocabulary in the words CAT, CHILDREN or CITY, calling for a different C-response in each case, but these responses have different frequencies in the English language. The reading-method vocabulary will reflect the general frequency of the three sounds in the language as a whole. The hard-C response will be made conscious first as being the tool of greatest usage, though it will be assumed that the sight-response to CHILDREN and CITY will continue to operate as usual, all three having been in the sight-vocabulary. The surrounding context of known sight-words will help him arrive at the correct response for C in the three-alternative ambiguity which any new C-word presents.

We can imagine, for illustration, the pupil meeting in print for the first time the word COAT. The teacher has prepared the way for this occasion not only in the phonics training by which the child has learned to distinguish the common sound at the beginning of CAT-CUP-COOKIE and to identify that sound with the letter C. She has made more recent preparation. Just before the reading there have been discussions in which the subject of clothing, perhaps the word "coat" itself, have figured. Then comes the sentence with the new word among known words.

Mother said, "Tom, it is a cold day.
Put on your coat."
Tom put on his coat.

The child meets the new word. He tries out the most familiar response to the first letter — the hard-C that has been trained consciously. Perhaps there are traces of response also to the second letter O and the

final letter T. The context permits few alternatives. Mental background, familiar word-context together with his response to the letter allow him to arrive quickly at the right word-sound "coat". His specific response to the letter C alone would still have left the identity of the word undefined, but the larger-context defines it. The situation was of course an arranged one, or otherwise might not have worked out so smoothly. If the sentence had been, "It is a cold day, and your cheeks are red," the dominant response would have been a false lead. The pupil would need to have been more prepared with experience, conscious experience, of the alternative sound for C in combination with H, or else the context would need planning so as to bear yet more of the burden of communication.

Preparation for this kind of situation is of course the task before anyone who would prepare teaching materials and programs. The authors must be sure that the degree of preparedness is adequate to the amount of ambiguity which challenges the learner at every stage. He learns by facing ambiguity dilemmas, for it is only by those that he comes to make the discriminations which synthesize ultimately into the generalized skill and knowledge of the language and code. By such procedures as this the pupil comes to face the ambiguities of the language-code and make their resolution-through-context as he goes along. But the gradient must be carefully calculated, or only discouragement, failure of interest, and ultimate sense of frustration in the face of ambiguities and the entire problem of reading could be the result.

But when through adequate planning the program is successful, the pupil, having begun with a recognition-vocabulary learned through a non-code context and drilled in a wide range of linguistic patterns, progresses from such gross-pattern response through more and more discriminating perception of detail in the patterns, to an increasingly flexible skill in taking into account specific phoneme-grapheme relationships, whose ambiguity he can then resolve through the help of context as mature readers do. And this is accomplished without at any time inhibiting the spontaneous "reading-response" originally gained through the picture-context.

But consider now what happens in teaching of music-reading. Discouragement, failure of interest, and ultimate sense of frustration are common experience among pupils here. Instead of discovering music-notation as a means of communication, instead of experiencing the discovery of familiar satisfaction through emerging understanding at every stage, the pupil meets the code as a complex cipher which, if he manages to get anything out of it at all, he does at such cost that the result has no characteristics of spontaneous and satisfying activity.

Spontaneous and satisfying activity however is characteristic of the learning process in the language program right from the beginning, when the pupil starts immediately finding meaning in the page presented to him. From the outset he can translate what is on the page into familiar language, and difficulties are not introduced at any faster rate than the average pupil is prepared to solve them.

Would something comparable be possible in the music program?

Taking as a point of departure the extent to which the code problems of language and music have been demonstrated as analogous, the model of the teaching procedure used in the language program, as just outlined, would suggest certain principles for a comparably effective music-reading program.

General requirements would be as follows:

First, so far as possible, only one code should be involved. We should see what might be done with staff-code alone, attempting to look on it as a device for communicating interval-relationships free of any instrumental inference of fixed pitch. Because of the instrumental connotations, as well as for other reasons which will emerge, it may be well also to abandon any prejudice in favor of the conventional number of five lines.

Second, we need to find a way in which, through some context, the pupil can be enabled to "read" immediately and independently and continue to do so at every stage in the progress of the program. We need to establish the precise nature of whatever would be the musical counterpart of the "recognition-vocabulary"[4] in the language teaching procedure.

Third, we need to plan a teaching procedure from this starting point of "first communication" such that, as the vocabulary increases in extent, the pupil's attention is brought to bear (preferably without much direct management by the teacher, but nonetheless dependably) on the detail characteristics of both the sound-patterns and the notation-patterns, and the correspondence between the two made evident to him so that he will begin to use "clues" in the notation itself to help his recognition of the sound-patterns encoded therein.

Fourth, throughout all the reading material and throughout supplementary classroom activities and exercises of the workbook type (both of which must be gauged to retain his interest) we must discover how to prepare him to resolve ambiguities in the code as the reading material introduces him to those ambiguities. If we can do this, calculating the gradient of progress with sufficient care, it might then be possible to lead him to the stage of actual mature code-reading with no frustration of his original spontaneous discovery of musical meaning on the page.

Such are the general requirements that must be fulfilled in any

4. Some current methods for school music teaching make use of this term "recognition-vocabulary" and invoke the language analogy and reading methods in their theory. A careful study of the theory and practice of such methods forces the conclusion that the analogy with language and the principles of language-reading methods have been inadequately apprehended by their authors. Our use of the term follows the language-analogy precisely.

program that would follow the analogy of the language-reading procedure. It is possible also to draw up some of the specifications for such a procedure without straining the validity of the music-language analogy, and in a form which one can still conceive putting to practical application. Let us make the attempt.

The first requirement was that of the material with which to introduce to the pupil the experience of "reading" music from the very beginning, letting him experience the delight of "getting music off a page" by his own efforts, as he did the words in his language primer, from clear contextual clues. But what context, since music does not have meanings one can illustrate in pictures, as words do? The context could be a story, a story about people who sing, so that the singing would come into the story quite naturally, and singing would then be part of the "reading" of the story. This would of course determine the earliest date for introduction of such material in the school program — probably about third or fourth grade, when language reading is already fairly fluent.

What would serve as "recognition-vocabulary" in such a reader? The sources should be songs such as might be well-known to the pupils from home as well as school experience. Whole songs presenting too large a unit for such a purpose, one must decide on what musical unit will be most appropriate for the vocabulary-unit. Each must be a musical whole of discrete and recognizable individual character. The title phrases of "common heritage" songs would answer this requirement. Such songs as "Old Macdonald had a farm" are of nearly universal currency in the United States, and it is such everyday tunes that we would need. And of any songs the part most clearly apprehended, the part most readily recalled, is the small unit of the title phrase (as Tin Pan Alley and Hollywood have learned to their profit).

After "recognition-reading" is achieved, how then should the process of "analytical listening", "analytical seeing", and the development of discrimination between the characteristics of one tune-phrase and another (in both sound and notation) be brought about? And how is "drill" to be accomplished? For in music there is no parallel to the syntactical frames of language and musical phrases are not to be interchanged and recombined as words are in language. Thus one of the most important means whereby drill is brought about with words in the language-program has no direct analogy in music.[5]

5. At least one of the popular "method series" in wide use in the schools has attempted to make this kind of practice possible, by invention of groups of song-tunes in which the same musical phrase reappears in one tune after another. The results, from a musical standpoint, are entirely synthetic. In living music, the kind that children spontaneously sing with enjoyment, the kind that children spontaneously invent, and in the "common heritage" songs that have the wide usage and live interest that our purpose demands, this kind of thing does not happen. Such artificial constructions are hardly calculated to stimulate interest as music.

But analogy need not be forced that far. The main difference between language-code and music-code, and the central fact for our consideration, lies in that the staff-code is not an entirely arbitrary symbolism, as written language is. Words, both as sounds and as printed patterns, are symbols with assigned significance. Printed words in no respect "look like" either their sound or their meaning. Staff-notation, on the contrary, is in effect a picture, in which a succession of notes "moves up and down" on a page to represent "up and down" of melodic movement. The rhythm is also "pictured". Distribution of the notes from left-to-right on the page represents distribution in time and, if publisher and engraver have been conscientious[6], the proportions of time are represented visibly in the proportions of space in that left-to-right movement, so that the note-values as represented by note-shape offer a merely reinforcing symbolism. This greater accessibility of the sound-pattern in the symbol-pattern presents a problem far different from the complex arbitrary code of language, and one less formidable. It may be that less drill will be necessary, if the perception-training can be successfully accomplished.

The first "discrimination" assignment in the teaching procedure must then be a kind of perception-training aimed toward bringing about the pupil's recognition of the "picture" character of the staff-notation. The pupil needs first to be brought to perceive the "shape" characteristics in the tune-vocabulary and the "shape" characteristics of the notation picture and to identify the two. Puzzle-game workbook technics, certain planned ways of playing with the musical materials in the classroom singing, and carefully calculated dilemmas in the reading text could bring about such perception and arm the young reader with awareness of notation-clues to aid the clues which the story-context offered him. Gradually the material could force him to lean more heavily on such clues for identification of the vocabulary material.

Similar comparison- and identification-problems, bringing about sharper awareness on the pupil's part of the identities and differences relating the reading-vocabulary material, could well lead him to identify specific grapheme-units with specific phoneme-units, starting with the initial position where perception is keenest -- the opening step of a falling third, for example, with its pictured representation of two notes on adjacent lines.

So far the procedure is not difficult to conceive, working within a limited context of "recognition-vocabulary" tune-phrases and calculating the procedure with careful gradient so as to lead the pupil to identification of code-unit with musical-unit -- so that he is prepared to respond to the code-unit (relative position of two notes against staff) with singing of the correct interval.

But now we run up against the basic ambiguity of the staff-code, How can we prepare him -- without plunging him unarmed into the full

6. A surprising observation is that in the field of educational publications often they are not -- even in current methods which purport to exploit the "picture" aspect of notation.

confusion of the instrumental clef-key code — to orient his response to the code-unit in the diatonic system, to respond with the right choice between major or minor third in the proper relation to tonic? Is this possible without introducing an accessory code — letters, numerals, syllables, and all the logical apparatus of sharps and flats? Could it be done in the purely visual and pictorial code of staff? Is not that the weakness of the staff-code?

It is not a question of teaching him to orient himself in the diatonic system in his singing of tunes he knows, or of tunes as he hears them or as he invents them. The tonal orientation is so basic a characteristic of all Western music in the aggregate, as he has sung it and heard it — on radio, juke box, TV, movies, in church, on playground, at home, in school — that it is an ingrained habit in his musical thinking and activity. Children at a very early age conform in their singing activities to the basic patterns of the musical culture of their surroundings just as their speech activities conform to the basic patterns of the linguistic culture around them. They may sing on occasion "off pitch", but, if they do, it is a failure of perception and production, not of intention. Their "musical thinking" is firmly conditioned long before school age by the diatonic orientation.

That is not the problem. The problem is the same as that which faces any reader of music when he begins a song without previous cue of starting-pitch and tonic-chord from an instrument. If the opening interval is the falling third, is it the kind between G and E in the C tonality, or is it the kind between E and C? The wrong response in the initial step would put out of joint the entire sound-pattern from there on. A diatonic orientation could be strong and every step in the reading might be consistent with the orientation assumed for the first interval. But the whole tune would, as a consequence of a first misstep, be wrong.

Here, since the language problem has nothing analogous to suggest a solution, one must invent. How could one supply, in the notation-picture, a means whereby the reader's response could at all times take into consideration the tonal orientation of the interval relationship which the grapheme pictures?

One of the earliest-used devices of staff-notation suggests itself as a solution. If the staff-line representing the tonic were to appear in a distinctive color — let us say in red as contrasted with other staff-lines in black — it is conceivable that by the same technics of discrimination-training as those used in the language-procedure the pupil could be brought to distinguish between intervals in one or another relationship to that tonic and to respond in the light of that distinction. As a possible bridge to later abandonment of this device (and a closer approach to conventional notation), that line or space might be also associated with a symbol at the beginning of the staff, which would ultimately identify itself with that location as a pitch level of special significance. (Present-day plain-song notation uses such a sign for the Doh-line; for our purposes a heart or a "home-plate" shape have been suggested as appropriate to the "home" feeling which the pupil would

eventually associate with that line.) It might then be possible to carry the training to the point in later years when the reader might dispense ultimately with the red line and carry the location of that special staff-level in his head, as mature readers do. His reading would then have all the characteristics of mature reading, less only the preliminary roundabout calculation of the tonic position through the instrumental transposition-code. Yet, if the training-procedure were successful in bringing him to this stage, his reading would be on the basis of staff-code alone, with this one modification only — the symbol for location of tonic.

We would have supplied in the staff-picture all that singers need for adequate reading; after the language-model we would have developed the pupil's response to that notation from an original "recognition" of whole phrase-units, through increasingly discriminating perception of detail, to specific grapheme-phoneme response fully oriented in relation to tonic. We have, if we want it, the plan here for a straight-line development through to full use of staff-notation.

This general statement of an over-all plan and purpose is, like all such summaries of procedure, deceptively simplified of course. A step-by-step strategy would need working out to assure that, in the total configuration of any notation-picture presented to the pupil, he would be able to differentiate between those characteristics which are immediately relevant to the appropriate response and those characteristics which are not. Visual simplicity of the notation-picture is imperative at first. The significant characteristics which must govern the response are the relationships of successive notes to each other and to the tonic location in terms of staff-lines as background, and we must become aware that more than these essentials cause trouble for the reader. If one tests out the ability of young pupils to respond to notation-patterns one discovers quickly that conventional notation has many elements that are visually confusing, and the problem of avoiding such confusion turns out to be similar to many problems such as have preoccupied psychologists of the Gestalt school. It turns out to be advisable that any irrelevant elements be at first eliminated from the notation-picture. The conventional five-line staff is much of the time only functional in part, and its non-functioning elements merely distract and disperse the focus of attention. A more sure response is to be gained by limiting the number of staff-lines to the range actually involved in the significant relationships between notes in the melody-fragment on any given appearance, and that may be any number from one to five, though rarely at first the latter.

The technic for focussing attention on significant characteristics of any given configuration, assuming that avoidable and non-essential elements are at first eliminated, is precisely that by which one trains laboratory animals to make responses to a specific signal: one "randomises" the non-significant characteristics of any configuration during its several appearances, so that correct response is associated only with the constantly recurring aspects of the pattern. So the notation-picture to be associated with any given song-fragment might appear in any of several staff-line settings, only the relationships defining

its identity remaining constant.

It may be noticed that both the training-program in language-reading and the music-reading program we have projected may be looked on from a laboratory-psychology point of view as the calculated and progressive conditioning of an initial response gained through another means than the code to be taught. The guiding principle in planning of materials and procedures must be the endeavor never to inhibit the spontaneity or assurance of the reading-response at any point from first "recognition-reading" through "pseudo-reading" (part code, part context) to actual code-interpretation. There must always be the discovery of music "in the page", the knowledge and pleasure and satisfaction of reading.

It will be of course considerably more than the likeness to laboratory procedure implies, for the first reading will take place against a background and as an outcome of classroom music activities -- singing and "play" with music such as is outlined in present-day music programs for the early grades. The development of reading skill will also involve an accompanying development of insight and understanding, increasingly rational as the knowledge and skill accumulate and develop. If the original spontaneity of the reading process is never lost, the pupil's self-identification and confidence in the music activity should make such further rational understanding accessible to him. All this would call for carefully planned materials and activities, and manuals to help the teacher execute them effectively and with understanding.

An impractical or Utopian proposal? Perhaps so, but perhaps not; one cannot know without trying it. Pessimism cites the difficulties experienced in finding adequate time for music activities at all, let alone music reading, in school programs; and objects that however carefully materials might be planned, skilled teachers — still in short supply — would be needed. One can only suggest that, on the one hand, a demonstrably successful program of music-reading teaching might have less difficulty making its way; and on the other, that one of the requirements of a successful program would be that it should be possible for a classroom teacher to handle it with little advice from any music specialist. The minimum requirement in a teacher — and possibly the maximum needed if materials and procedures were adequately planned — should be the ability to "carry a tune" and an interest in singing, plus the willingness to attempt such a program. Certainly any program that would teach the pupils to read music would much more easily teach the teacher. Any musical materials that would be commonly enough known by school pupils to fill our needs here would be equally commonly known by "tune-carrying" teachers. And any teacher with those qualifications who was familiar with procedures used in teaching language-reading would understand the parallel procedures we have proposed for teaching music-reading.

The procedures used in the language-program, by which so large a percentage of pupils are led to cope with reasonable success with a written-language code of almost fantastic ambiguity, are the product of

generations of experience in teaching children, generations of experiment, careful calculation of the appropriate progress gradient judged in the light of experience, ingenuity in the invention of materials for reading-books and workbooks, trial and error, revision and reappraisal. Experience of a great many false trails in the search for effective teaching methods and materials lies behind the present procedures which, for all criticism, it must be admitted, have reached a high level of effectiveness. Such a program as we delineate for music-reading might well demand no less. But in this direction the musical profession has hardly begun, even to the extent of a tenable theory.

No one who has observed the spontaneity with which young children use their singing voices, passing from speech to song and back again without inhibition or self-consciousness, will doubt that if that same spontaneity might be retained without inhibition in the first introduction to formal music-training, a nation of vocal-readers is at least within the realm of theoretical possibility.

We have attempted to demonstrate that procedures in the language program offer the suggestion of an approach which might conceivably bring that possibility closer. We have done no more than sketch a possible theoretical framework for such an approach, but that, it would seem, is one point to begin. And such an analogy with the language-procedure, if it is, as we have tried to demonstrate it, a sound one, opens a challenging lead for development of method. Its pursuit would take only idealism, imagination, ingenuity, patience and time.

BOOK REVIEWS

Edited by
Donald Loach

INTRODUCTION TO THE THEORY OF MUSIC. By Howard Boatwright. (W. W. Norton and Co., Inc., New York, N. Y., 1956, pp. 289, $4.25).

RUDIMENTS OF MUSIC: A Detailed Study in Music Essentials. By Jeannette Cass. (Appleton-Century-Crofts, Inc., New York, N.Y., 1956, pp. 290, $3.75).

These two very different books offer yet again fresh approaches to the problematical "first-year theory course." They both start from scratch and aim at the same goal: to provide a background for studies in harmony and counterpoint. The requisite preparation, both authors agree, consists in the mastery of basic terminologies and problems of notation, some fundamental musicianly skills ("ear training," "sight singing"), and easy familiarity with the apparatus of scales.

Their routes to this goal diverge immediately. Miss Cass promptly introduces the seven "sharp" major scales in Lesson 2 along with seven "unusual" sharp keys. By p. 16 she has completed the circle of fifths with "B-sharp major" and has extended it to a fearsome "C-double-sharp major." On the other hand, Mr. Boatwright, in a handsomely produced addition to the Norton list of books on music, reserves a complete explanation of the system of major scales until "Experiment 52" (p. 185), which in a full year course would fall around spring vacation. Miss Cass's exercises for sight singing are drawn principally from "classical" instrumental music—themes from Haydn symphonies, Beethoven sonatas, Lange's Flower Song, etc.—while the most familiar melody in Mr. Boatwright's assignments seems to be one from Schoenberg's Fourth Quartet.

These random comparisons point up the current diversity of solutions to the pedagogical problem with which college teachers of music theory wrestle. The problem is contained in the fact that the musical instincts and practical experience of most eighteen-year-old musicians far outdistance their acquaintance with the elementary grammar of music and with even the simplest "naming of parts." It is all too common for a freshman to spend an hour a day in Music 101 learning his ABC's and another hour executing nicely Beethoven's Op. 22 or listening intently to Le Sacre. The essential information which should have accompanied his first steps toward musical dexterity seems tedious indeed at this stage. The C major scale pure and simple has an existence solely as a finger exercise (so I have been told) and four-part writing is encountered only in hymn books. The resistance of even unusually intelligent students to the baby steps of introductory theory is sometimes formidable.

Miss Cass believes in administering the rudiments as quickly as possible with few questions asked or answered. Indeed, her book grew out of a concentrated six-weeks course in a summer music camp at the University of Kansas. As presented here, its material might well occupy most of a winter semester.

Rudiments of Music has the convenient format of a workbook. The order of presentation is: Lesson 1, the seven clefs and transposition by changing clefs. Lessons 2-7, all major and minor scales including the "unusual" ones bearing "upon the analysis of some twentieth-century compositions." Lessons 8-9, intervals. Lesson 10, rhythmic values, meters, and rhythmic patterns. Lessons 11-12, 270 sight singing and dictation exercises in all seven clefs. Lesson 13, construction of major, minor, diminished, and augmented chords (the term triad is not used). Exercises in keyboard drill and other exercises in singing and dictation are interspersed throughout the book. Removable worksheets and tests for each lesson and a complete final examination are provided. No demands are made on the inventiveness of the instructor in this respect.

The author relies on the presentation of the machinery of elementary theory in a form which can be memorized and drilled. Her tone is "This is the way things are," and her remarks are mostly confined to small assists and crutches which will help the student to manipulate the drills. They can be gone through methodically and with little fuss, provided the student keeps in check any speculation as to why and wherefore. No definition of "scale" is given, though he is required to memorize sixty versions of the major and minor scales. The usefulness of interval classifications is not explained, though he is held responsible for 28 of these. The possible existence of music which evades the canon law is only vaguely suggested in connection with those "unusual major scales" and with the statement, "In some of our twentieth-century music, composers use chords built on the interval of the fourth."

The language of the text is quite direct and easy, though some of the definitions are woolly: "Enharmonic means the same sound with a different name" (p. 16). "The key signature of any tonic minor scale is three flats more than the major scale with which it is associated" (p. 62). In a time signature..."the upper note always (sic) tells how many beats there are in a measure, and the lower figure always tells what kind of note receives one beat" (p. 145). "When the value of a note is greater than one beat, it is known as an added beat" (p. 148).

The sight singing exercises are numerous for so compact a book and they cover a wide variety of 18th and 19th century styles. There is a brief note on each melody. A number of them, as for example the slow movement of Haydn's "Clock" Symphony or Chopin's E-flat Nocturne, are decidedly unvocal.

After closing this book, the student will have to jettison quite a lot of cargo before making headway. The soprano, mezzo-soprano, and baritone clefs will probably be the first to go unless he willingly

spends many more hours acquiring a French-style facility. Then triple-sharps, C-flat minor, and F-double-sharp major will be dropped aside. He will be forced to revise such notions as this: the melodic form of the minor scale was used "to avoid the augmented second occurring in the harmonic form." But he will long remember that he had first to endure musical terminology, hoping it would be explained later.

Mr. Boatwright believes that an introduction to music theory should be a slow, inquisitive procedure. His text is an elaboration of material for full year courses in the Yale School of Music and Yale College. It is designed to precede a class in traditional harmony, or equally well, one in sixteenth century counterpoint. The fact that it supplies a foundation for either course illuminates its basic premises: study of the musical substance must begin with the unfailing elements common to all musical styles—rhythm and melody. Theoretical abstractions and fundamental practical skills must be learned first in terms of their "style-less" constant units. These units are in the case of rhythm the "beat," and for melody the interval. Thorough mastery of these can lead the student smoothly to the larger organization of living musical forms—melodic curve, rhythmic pattern and meter, phrase and cadence—and to theoretical reductions of musical style. In the case of melody especially, these reductions are the gamut, tonal orders (pentatonic, diatonic, chromatic), and scales. The student may then proceed to the analysis and performance of many styles of linear music—Gregorian chant, folksong, chromatic melodies—and finally to the writing of melodies and the development of a melodic sense within a carefully explored style.

This is the lively philosophy of a thoroughly contemporary musician which underlies the Introduction to the Theory of Music. His method is entirely practical and has the novel virtue of being immediately applicable in some respect to any music the student plays or hears, if only by comparison. With its emphasis on the melodic aspect it restores to a place of first importance in music studies the very element which has been obscured by the self-perpetuating procedures of major-minor traditional harmony.

The arrangement of material is an ingenious combination of practical, historical, and purely theoretical information. The text is divided into two large sections, "Intervals and Rhythms" and "Scales and Melody." There are four valuable appendices on physics of music, instruments of the orchestra, examples of orchestral scores, and musical terms and signs.

Without saying so, the author presents basic definitions and conventions of notation somewhat in the order which they followed historically. Diatonic intervals and pitch names are defined on a several-octave segment of white keys of the piano (the "gamut"). The first accidental (B-flat) is introduced on p. 123. Chromaticism and the complexities of chromatically spelled intervals are presented (Ch. 12) long after interval classifications and staff notation have been mastered in terms of the gamut. Rhythmical patterns are performed before musical

notation for their transcription is introduced, and meters are perceived before time signatures are learned. Assigned practice in all of these matters are given as "Experiments," but much leeway is left to the instructor and students to devise further drills.

The most interesting part of this book is the latter half on "Scales and Melody," which will require careful study on the part of instructors contemplating its adoption. It proposes the study of scale derivations and their use in melody writing after two models: Gregorian chant and medieval French monophonic song. The author introduces the eight Gregorian modes and the stylistic criteria for their use after the Enchiridion musices by Odo of Cluny, discussions of declamation and form, and model chants for singing and analysis. English texts from the Psalms are given to be set.

Melody writing on troubadour and trouvère models leads the student closer to major and minor scales through the secular modus lascivus and the alterations of musica falsa applied to the Gregorian modes. The strictures of the rhythmic modes, the fixed forms chanson and rondeau, and the relation of poetic and musical rhythm in this style are set forth as the basis for like compositions on English translations of French medieval texts.

After a discussion of the infringements of polyphony and harmony on these purely melodic systems, the student is prepared to follow the development of the traditional major-minor apparatus in the concluding chapters. The full complement of keys is set forth only after a sketch of the development of equal temperament. The final assignment is the composition of simple instrumental melodies in major and minor keys without reference to any particular eighteenth or nineteenth century style. At this point the author says, "The reason we cannot at this stage compose melodies in familiar style (except, if we wish, "by ear") is that the principal means of regulating them lies within the sphere of harmony, and harmony is a whole new subject which in itself requires an effort at least comparable to that exerted so far in the present study. Only after a fairly substantial acquaintance with harmony could we attempt stylistically controlled experiments in melody-writing along traditional lines."

That statement contains the crux of the author's decision about what is certainly the most controversial point in this book: the wisdom of choosing chant and trouvère songs as models for analysis and imitation. The remoteness of these repertories from the average student's experience is a considerable factor, but study of them will serve as a sure foundation for comprehending the fluid nature of musical evolution and for developing an unprejudiced musical perception. The traditional theory of the period of common practice will no longer seem like a self-contained Omega, separated on all sides from his studies in the history of music and his own personal musical experiences.

Mr. Boatwright's language is mature, perhaps too mature for some of his intended readers. Though the going may be rough for some first-year students, there is a cardinal advantage: nothing need be un-

learned later. His explanation of the development of the melodic minor scale fills a page. Here is one of his definitions of a term which is usually verbally mangled: "Different spellings of the same sound are called enharmonic equivalents."

Granting the author's basic premises, one finds little to quarrel about in this carefully written and carefully produced book. I must confess I have never seen a conductor marking 13, 14, and 15 beats to the measure--the diagrams for these conducting patterns are formidable. And surely some bright student will confront his instructor with pages from the Liber Usualis which disobey Odo's regulations forbidding the use of B-flat and B-natural in the same melody and the statement that "in chant the flat is never used on the low B."

JOHN WHITE

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MUSIC FOR SIGHT SINGING. By Robert W. Ottman. (Prentice-Hall, Inc., New York, N.Y., 1956, pp. 299, $4.00).

Robert W. Ottman deserves both thanks and commiseration for his labor of locating, culling, and organizing these 584 sight singing examples. A special award might also be considered for his brevity of written word, for rarely does he use even half one page of text at the beginning of a chapter. Quality, quantity, organization, clarity, and flexibility of usage are prime requirements for a sight singing collection. This book not only satisfies these requirements; "Music" is the justifiable first word of its title.

The author's intention, as outlined in his Preface, has been to bring to this book "a considerable amount of singable and musical materials... drawn from the works of reputable composers [definition of "reputable" not given] and from a wide range of folk music of the world". His music sources date from the thirteenth through the twentieth centuries. No examples have been composed for the book. The average student will find very little material already known to him – which is as it should be for the book's purpose – and, when he wants a change from the usual in his sight reading practice, he can entertain himself with some unusual Mexican and South American folk tunes, or he can turn to page 165 and try some West Indies Calypso. Additional statements from his Preface indicate that he intends to deal with "one problem at a time". "Melodies", he writes, "... are graded according to both rhythmic difficulty and melodic difficulty"; new problems are introduced "in one or the other ... but not in both simultaneously". "Intervals ... are presented first as members of specific triads".

The author suggests that you may want to revise the sequence of the book as you use it. Agreed – it would appear advisable. Mr. Ottman uses "degree of rhythmic complexity" as his basic control for organization. Within each of the three parts, (The Beat and Its Division, The Beat and Its Subdivision, More Difficult Melodies and Rhythmic Problems), pitch problems are simple at the beginning, relatively com-

plex toward the end. Students for whom rhythms are not problematic may prefer a sequence based on intervallic complexity. The following order might serve: Chapters 1-7, Chapters 11-12, Chapter 8, Chapter 13, Chapters 9-10, Chapters 14-15, Part III.

C-clefs appear in Chapter 5 and reappear in some examples in each following chapter. This should be noted where sequence-revision is attempted. There should be no need to juggle chapters to effect key-coverage for each chapter treats a variety of key signatures. Do note that there are many more melodies in major than there are in minor. If a student feels the need of more practice material in minor, additional problems can be created by mental change of key signature.

Since students often associate accent with the bar, caution might be advisable in using some of the melodies. For example, in Part I, numbers 245 and 261 fall under a chapter heading of "syncopation". No. 245 is given 2/4 meter, but phrases itself as 5/8 plus 3/8. No. 261 has a meter of 6/8 but several measures flow more naturally in 3/4. In instances such as these, a change of beat-duration would seem more musical than an attempt to produce beat-conflict syncopation.

The same tempering can be used in several of the examples taken from earlier centuries. Most such examples will be found in Part III and here the author does warn the singer in his introductory paragraphs.

This is a helpful and practical book. It should win considerable acceptance.

FRANK B. COOKSON

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LEARN TO READ MUSIC. By Howard Shanet. (Simon and Schuster, Inc., New York, N. Y., 1956, pp. 172, $2.50).

> "You, too, can learn how to draw... to write... or to model. You, too, can now "Learn to Read Music."

The "you" in this case is the music appreciation student or any dogged layman willing to concentrate. The subject of the book is "how".

This book, which unfolds in five sections of text and three appendices, is clear and careful. Superficiality is avoided, yet the detail is awesome, in view of the reader for whom it is intended. It should work -- and Mr. Shanet doubtless would retort "It has worked," for the procedures have been tested by him, many times, many places.

Students in schools and departments of music should already know everything Mr. Shanet here discusses, yet very few do. This book could be useful to the teacher responsible for music fundamentals. It should be remembered, however, that the author has written for the layman and builds his presentation item by item. The sentences of encourage-

ment interpolated in the text are probably necessary. The occasional mild deceits used in introducing some topics are deliberate and practical. (As he read the book, the reviewer found himself often thinking "Oh no!" only to have Mr. Shanet take care of the situation on following pages when the reader was thought to be ready for a modification of an earlier presentation.) For example, on pp. 4-5 the quarter note is the beat in music, but on p. 31 and p. 47 other possible beat values are discussed. On pp. 1-24 all quarter notes flow as in a fast march; yet different possibilities turn up on pp. 25-27. That all music begins with a complete measure is assumed until p. 101, and only after p. 125 are curved lines over notes considered to be anything other than ties.

Faced with the problem of defining half-and whole-steps, he crosses two fingers of his free hand and procedes to write (p. 78), "It takes 440 vibrations per second to produce A, about 500 for B, and about 530 for C. Therefore, B is about 60 vibrations per second faster than A, but C is only about 30 faster than B. This means that it is easy enough to squeeze an A# between A and B, giving it about 470 vibrations, and placing it 30 vibrations away from its neighbor on either side; but B and C are already only 30 vibrations apart, so there is no need to insert another tone between them". Very sensible. "About" is a justifiable word when you think what would happen to the reader if specific "cps" had been given.

The author's preliminary statement explains, "These lessons won't teach you to sing beautifully or to play the piano or the bazooka. But if printed music has been a mystery to you... then the study of these pages will enable you to take any simple melody in musical notation and work out the meanings of the symbols for yourself." I'm inclined to agree, again — it should work.

FRANK B. COOKSON

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BASIC COUNTERPOINT. By Harold F. AtKisson. (McGraw-Hill Book Company, Inc., New York, N.Y., 1956, pp. 171, $5.00).

Mr. AtKisson's manual, designed for a one year course in sixteenth-and eighteenth-century counterpoint, proceeds on the premise that the materials presented must be "of the greatest immediate and practical value to the student." As our knowledge of Renaissance style has been considerably increased, the teaching of composition in this style has undergone revision. Increasingly, technical procedures are being established in terms of the style. Mr. AtKisson has discarded the traditional "species" approach to sixteenth-century polyphony and adopted the more enlightened methods employed by Gustave Soderland (Direct Approach to Counterpoint in 16th Century Style. New York: Appleton-Century-Crofts, Inc., 1947), Quincy Porter (A Study of Sixteenth Century Counterpoint. Boston: Loomis & Co., 1940) and others. However, the primary element of polyphony, i.e. melody, suffers neglect.

The close similarity between Renaissance melodic style and that of Gregorian chant has been recognized for some time. The characteristics of plain-song are implicit in Renaissance melody. Pure melodic invention unencumbered by harmonic considerations, the root of all stylistic study, is imperative background for composition in any Renaissance style. No theorist has written of the value of plain-song, nor suggested a pedagogical approach to its study as a background for understanding Renaissance melodic style more completely than Arthur Tillman Merritt (Sixteenth-Century Polyphony. Cambridge: Harvard University Press, 1939). Although Professor Merritt fails to elaborate on melodic patterns in plain-song as the primary characteristics which differentiate the modes so clearly, it remains that few have demonstrated more enthusiastically their conviction that in chant resides the source of sixteenth-century practice. Mr. AtKisson, unfortunately, does not explore beyond the realm of finals, dominants, and cadence tones which Mr. Soderland (op. cit.) and Mr. Jeppeson (Counterpoint. New York: Prentice-Hall, Inc., 1939) have so neatly presented.

Another important characteristic of plain-song, the freedom of its rhythmic organization, is immediately related to Renaissance melodic style (and to the freely organized melodic style of our own contemporaries). Again Professor Merritt has observed it most clearly. He accepts the precepts of the Solemnes monks and their interpretation of chant rhythm, and demonstrates that this rhythmic freedom is inherent in Renaissance melody. Mr. AtKisson, however, makes no mention of this important melodic phenomena. He adheres to the idea of a compound binary rhythm with its primary and secondary metric accents, which, in terms of polyphony, must of course be observed; however, he does not permit melody to flow outside of these confines. It follows then, that he has imposed upon his melodic concept the idea of syncopation, not as the Renaissance composer understood it, but rather as it has been generally defined in more recent times.

In general, Mr. AtKisson has not succeeded in overcoming harmonic and metric notions which, though they bear greatly on the styles of post-Renaissance music, must be considerably revised if they are not to hinder the free melodic style of sixteenth-century polyphony.

In dealing with eighteenth-century style a curious reversal takes place. The harmonic element, upon which all is built in this style, is barely discussed; rather, Mr. AtKisson favors the melodic idea without sufficient attempt to demonstrate how melody is at the mercy of harmony, harmonic rhythm, and tonal organization. Walter Piston (Counterpoint. New York: W. W. Norton and Company, Inc., 1947) makes the essential features of the style and their relative importance quite clear. After an examination of various melodic styles, he devotes a large portion of his book to the basic element of eighteenth-century counterpoint, i. e. harmony. What a pleasure not to be burdened by the infinite number of rules which are so easily swept away when melodic pattern is seen to be the decoration of simple harmonies artistically combined to give progression and movement. And how pleasant not to be burdened by inventions and fugues (Piston hardly mentions them) as if the whole Baroque could not have functioned without a "subject" and

"answer".

Mr. AtKisson has a healthy regard for generalization. Binding laws have been reduced to a minimum. In addition, he has attempted to construct a text "which concerns itself with terse explanation and direction only, in order to eliminate confusion". There remains some doubt, however, whether confusion has really been eliminated by the author's terseness. Extensive additional material and explanation would be imperative if the student were to gain a working knowledge of the styles being studied. Background material is lacking. Indeed, an historical linkage between the sixteenth-and eighteenth-centuries is attempted, but it is doubtful whether any historian or theorist would give musica ficta a thought in making such a connection.

DONALD LOACH

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BACH'S FUGAL WORKS. With an Account of Fugue Before and After Bach. By A. E. F. Dickinson. (Pitman Publishing Corp., New York, N.Y., 1956, pp. 280, $6.95).

We may accept this volume as an exceptionally faithful compendium of facts and statistics of many kinds, relating to Bach's accomplishments as a fugue writer. Mr. Dickinson provides us with a gigantic study which covers practically the entire fugal output of the great master. The study is arranged more or less chronologically, starting with the early organ fugues (in which he does not hesitate to point out various weaknesses which he finds), and continuing on with special attention to the 48 fugues of the Well Tempered Clavichord, and many pages devoted to the Art of Fugue. This main part of the book is followed by a chapter on Bach's fugal craftsmanship, which supplements and classifies information gathered in earlier chapters. Not content with this, Dickinson adds some 58 pages dealing with fugal writing before and after Bach.

For any student of music who feels that there is a lot to be learned by an extensive study of the work of a great genius, this book can be very useful. The text is crammed with detailed information about many phases of Bach's accomplishments, and adequate references to the original scores. If one is seeking examples of stretti, inversions, double counterpoint, invertible counterpoint at various intervals, double fugues, all kinds of answers, one can find all one wishes. The indexes will prove of great value when the book is used for reference. All of the works discussed are well listed in an Index to Music. There is also a Technical Index, which lists all references to the multiple technical devices which appear in fugal writing.

In his own introductory words, Mr. Dickinson intends his book for "the adventurous listener who..... may make up his mind.....to settle his account with Bach's fugues as a whole". He has attempted "to provide such an explorer with a comprehensive study of Bach's fugues, as a body of practical composition which happens to constitute the chief, perhaps the sole, landmark of fugal expression". From the last page

of the text I quote again: "As a creative stimulus, fugue is now dead, just as the sonnet is dead.... The old patterns of rhyme and rhythm cannot be repeated".

Thus it would appear that it was not his incentive, in amassing quantities of factual information about the entire fugal output of Bach, to provide youngsters with an infallible system for writing fugues, since "composition 'by rule' is finished".

That it is not conceived as a text in fugal composition might be considered unfortunate. Can one be sure that fugue is dead, or may it just be that fugal composition by one particular set of "rules" is no longer worth while? Bach was one of the great geniuses who changed restrictions in order to make better music. One feels that Mr. Dickinson is satisfied by showing just what Bach did — and this he does thoroughly with copious illustrations of every variant of each "rule". If only more effort had been devoted to an explanation of the exceptions to the rule, the book could have become a fascinating study of the working of the mind of a genius. It would have made a book which would have been of great service in teaching students why "rules" are broken; it would have given an eloquent illustration of the process of musical evolution.

Most unfortunately the style of writing in this book is affected and quite forbidding to the average reader. One reads on the first page: "Similarly, as the twisted course of fugue before Bach and its uncertain survival after his time are assimilated, with their respective problems of too little or too scattered and then too voluminous evidence, the desire to impose a pattern of spontaneous or arrested development or decline, and to enrich it with cumulative instance, becomes irresistible, without any particular obsession with abstruse knowledge or recondite technique". After unravelling this sentence one suddenly becomes aware of the author's purpose in writing the book. The going is easier once the author becomes immersed in his subject.

It appears to the reviewer that two of the most remarkable features of Bach's fugal writing are the construction of the subjects themselves, and the methods by which, in them and in the fugues as a whole, he achieved rhythmic propulsion. These two facets of his genius are scarcely touched upon. There are some old patterns of rhyme and rhythm about which we ought to know a great deal more.

QUINCY PORTER

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THE COMPOSER AND HIS ART. By Gordon P. S. Jacob. (Oxford University Press, New York, N.Y., 1953, pp. 121, $1.40).

A COURSE IN MUSICAL COMPOSITION, PART I and PART II. By Norman Demuth. (Bosworth and Co., Ltd. Agent: Belwin, Inc., Rockville Centre, N.Y., pp. 141 and 154, 12s 6d).

Two well-known English composers and teachers are presenting their views on composition and the role of the composer in present-day musical life. But while Mr. Jacob's little book is addressed chiefly to the layman, Mr. Demuth offers a well-organized and concise survey of his experiences as a teacher to the serious student of composition. Neither of the books contains any statements that depart radically from accepted theoretical concepts, and although Mr. Demuth includes twelve-tone composition and other twentieth-century practices in his considerations, most of his newer musical illustrations are taken from the works of the English and French schools of the turn of the century (d'Indy, Roussel, Dukas, Vaughan Williams, Holst, etc.). To the American reader the comparatively scant references to the work of Bartok, Stravinsky, and Hindemith seem regrettable, although perhaps indicative of the musical situation in England.

It is probably unavoidable that a listing of repertoire for specific instrumentations, such as Mr. Jacobs has undertaken, has to be selective; in a short book of this sort one has to question the value of information that by nature belongs to the field of musicology. This kind of incomplete information is also discernible in the record part of Mr. Demuth's book which deals with the form of the variation and suite (the study of larger forms being reserved for the third part). Historical perspective could perhaps reach somewhat further back to include medieval music which for the composer of today has gained in significance. But the chapters in the first part, dealing with "-alities" and "-isms" are sound and fill a long-felt need for a clear presentation of this material.

Some teachers of composition may disagree concerning the value of experimentation in various "-isms" and "-alities," such as Mr. Demuth suggests. The contents of what he calls a "basic course" and the transition from this course to advanced work remain the main problem in the training of a young composer; but until a completely fresh theoretical approach is established this problem will be with us. In the meantime Mr. Demuth has contributed a warmly personal and stimulating work that is the expression of a practical musician and experienced composer. Both books are well-written and make good reading.

BERNHARD HEIDEN

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SOUND AND SYMBOL. By Victor Zuckerkandl. Translated from the German by Willard R. Trask. (Pantheon Books, New York, N.Y., 1956, pp. 399, $5.00).

One of the most difficult aspects of any theoretical investigation, particularly if the subject under investigation is elusive, is the formulation of the problem. Before any right answers can be proffered, it is necessary to pose the proper questions. It is to this proposition that Professor Zuckerkandl addresses his present work, an inquiry into and a redefinition of certain basic tenets of musical thought.

It is the author's contention that scholars of various disciplines have given dubious answers to badly put questions regarding the problems of tone, motion, time, and space in the experience of music. He, therefore, devotes a section of his book to each of these broad subjects with the ultimate intention "to outline what may be called a musical concept of the external world." Specifying this general purpose, he continues: "Only when it can be demonstrated that..... the audible and the visible belong to the same reality; that motion of tones and motion of things take place on the same stage; that one space, one time embrace the world of visible event and the world of audible event—only then is a critique of our concept of reality from the point of view of music possible."

This, however, is not the course of argument presented in the book but rather, the reverse of it. The author proposes a view of reality which he feels is necessitated by the non-physical, non-spatial, non-material auditory experience of music with which he seeks to augment the traditional notions of material reality. He does not show in any clear way that the two realities are one, although he makes passing use of ideas which, if followed through, would certainly demonstrate this. On the contrary, he makes a sturdy case for the supposition of two kinds of space, two kinds of time, two kinds of motion, one characteristic of visible and tangible experience; the other, of audible experience. This discrepancy between avowed aim and the ultimate impression of the book leaves the reader and, apparently, the writer with one all-embracing and unclearly framed question: How is it that we are to understand visible, tangible, and audible experience "on the same stage"?

Professor Zuckerkandl hints at solutions to this question in two sections of the book. He proposes that all motion, not only musical motion, is a dual phenomenon, a succession of discrete entities and, at the same time, a relationship that overrides the discontinuity of discrete succession. As a special case of this sort of motion, music involves a succession of distinct pitches which are nevertheless subsumed under a single relationship. He proposes that all space, not only musical space, should be understood not only as an order of tangible and visible objects but as an order of related and interpenetrating forces each of which "fills" space completely but which, taken together, constantly alter the "quality" of this fully occupied space. Had either of these proposals been followed to its fullest implications, the author would have come much closer to accomplishing his purpose.

They were not followed through, primarily because the author eschews all inductive and deductive reasoning in the development of his viewpoints. He uses, instead, a mixture of descriptive, exemplary, and analogical techniques which seriously hinder the development of any rational exposition. It must further be added that many of the descriptions and examples are erroneous as, for example, on page 32) "the tonal basis of Western music is a system of seven tones arranged in a particular way"; on page 49) "in general the chord does not express the direction in which it points as clearly as does the tone"; on page 196) "nor does he (the conductor) ever mentally anticipate the beginning; he

always begins with the tones, not before them." Examples of these highly personal observations, represented as facts, appear frequently, demonstrating in many cases an appalling disregard for established historical or theoretical facts.

The most interesting thesis in the book is the proposal of a basic wave motion, both in space and in time, which imparts an inherent dynamic quality and temporal tendency to tones. The author makes it clear that these wave motions are not the result of tonal activities but that they are inherent facts of tonal space and time which give a single tone specific dynamic significance. These postulates of "willful space" and "willful time", a product of nineteenth century philosophical thought, are imposed upon the author by his assumption that sound itself is a symbol. He believes that a tone tells us immediately, by reason of its inherent dynamic qualities, where it wishes to go; and, that a tone, to borrow a chapter heading, is an "image of time". But, since a symbol must point to a preexistent fact in order to have any significance whatsoever, the author is forced to conjure up some preexistent tonal order, some preexistent temporal order, which tone may symbolize.

The author is incapable of extricating himself from the implications of this curious inversion of the truth. If a listener is faced with but one tone, how does he know in what diatonic order or what metrical scheme he is to understand it? The author solves this dilemma by proposing a mystical gift from some personified tonal space, some personified time, which would advise us immediately of both the tonal and metrical significance of this single tone. However, together with us, the author does not fully believe this. Although he asserts it on page 37 with "a tone does not need to enter into the context of a melody in order to acquire relation to a whole," he denies it on page 229 with "taken by itself, the individual tone is meaningless.....it is only by entering into relation with other tones.....that it acquires musical meaning." This sort of dialectic is characteristic of the entire book. Having disposed of memory as a reality, he continues to speak of memory and remembering; having eliminated tonal space, he talks about the order of tonal space; having discounted any directional sense in musical space, he brings a lengthy justification of it.

It is clear that Professor Zuckerkandl is aware of the problem, painfully aware of it because he is inextricably enmeshed in it. It would be difficult to say that he accomplishes more than to further entangle the threads of the net that has snared him. The author's problem is compounded by his acceptance of some preconceptions that are commonplaces in Viennese historical and theoretical method. Principal and most devastating of these is his ready belief that all music prior to 1700 was a struggle to arrive at the full potentialities of diatonic tonality and that all music after 1900 is a dubious attempt to depart from the basic truth of diatonic tonality. Although this is frequently implied, it is most directly stated in the parenthetical remark on page 316. Because of this assumption, no doubts would assail the author even if he were aware that his definitions of motion, time, and space are valid nowhere outside the period 1700-1900 if, indeed, they seem reasonable there. Since motion, time, and space are matters of such

broad application, any valid theory regarding them should demonstrate a certain historical universality which, if not evident, should demand a serious reconsideration. Although the excellent bibliography shows the author to be a widely read scholar, it is evident that he permitted a narrow and specious historical view to impair the critical examination of his ideas.

Although any scholar of speculative music theory should know this book, it leaves the impression of a man thinking aloud. His thoughts do not include the lucid solution to any problems nor do they pose any questions with such clarity that others could begin with them to develop answers. Thinking aloud is a necessity in all difficult undertakings, but one wonders if an unedited, stenographic report of such thinking warrants such an expensive and handsomely presented volume as this forty-fourth Bollinger Foundation publication.

DAVID KRAEHENBUEHL

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EMOTION AND MEANING IN MUSIC. By Leonard B. Meyer. (University of Chicago Press, Chicago, Ill., 1956, pp. 307, $5.75).

In this era of polemic, Mr. Meyer's discussion of emotion and meaning in music is a masterpiece of rational procedure founded upon two rare and healthy attitudes toward creative theory: 1) that two schools of thought which have been maintained as diametrically opposed may provide the theorist with valuable material if he can show the common foundation for both, and 2) that no school of thought can be dismissed summarily either because certain of its tenets seem dubious or because it fails to account for everything.

Applying the first attitude, the author is careful to point out on the first page of his book that the ancient feud between the "absolutist" and "referential" schools of aestheticians is largely founded on the dogged maintenance of both that these partial hypotheses are complete theories, each excluding the proposals of the other. In a later chapter, he applies a similar approach to the dichotomy of thought and feeling, demonstrating that they "need not be viewed as polar opposites but as different manifestations of a single psychological process." The second attitude is demonstrated by his carefully circumscribed acceptance of the Schenker theories of tonal and formal procedure, of which he makes extensive and wise use, while pointing out that they may lead to a dangerously static view of large formal sections.

The organization of the book is superior. The theoretical principles are presented in a compact and lucid exposition occupying only 82 pages of the complete work. This setting forth of postulates, hypotheses, and operational procedures could hardly be more succinct nor more thoroughly grounded in the traditions of inductive thinking. Following this theoretical account, the author demonstrates the direct consequences in musical practice of the proposals set forth in the first two chapters. He does not clutter his argument with attempts to justify or

attack the aesthetic views of composers, performers, theorists, or critics, nor are their views introduced at this point as supporting evidence for his theories. He limits his examples, therefore, to the past three centuries of Western music where he feels no need to prove that "the processes examined do, in fact, have affective aesthetic meaning." In the final chapter of the book, he adduces the opinions of experts to illustrate and support his theories, particularly in earlier and culturally unfamiliar areas of musical practice.

The basic tenets of the theory are summed up in the author's definitions of emotion and meaning. "Affect or emotion-felt is aroused when an expectation—a tendency to respond—activated by the musical stimulus situation, is temporarily inhibited or permanently blocked." Since he regards meaning in music as virtually synonymous with "affect", it is only necessary to specify the source and nature of meaning. He sets forth two kinds of meaning: designative (or referential) meaning and embodied meaning. This second kind of meaning, which he feels to be the essential meaning in music, is that which results from expectations set up by our prior acquaintance with music in general and by our immediate experience of the composition being heard. The degree to which our expectations are not fulfilled represents a measure of the affective meaning of a musical passage or, indeed, an entire composition. At one point in the book the author suggests a most fruitful avenue for further investigations when he observes a parallel between this lack of fulfillment and entropy in information theory. He continues, to divide meaning into three stages: 1) hypothetical meaning which results from the act of expectation; 2) evident meaning which is the reinterpretation of hypothetical meaning occasioned by some consequent experience, such an evident meaning being of itself a new expectation; and 3) determinate meaning which arises once the experience is presumed to be closed and is reconsidered as a whole.

He utilizes these definitions to develop three principles of pattern perception: good continuation, completion and closure, and the weakening of shape. The law of good continuation asserts that any "shape or pattern will tend.....to be continued in its initial mode." This constitutes a specification of the nature of hypothetical meaning which suggests only an extension of itself until some consequent provides an evident meaning for the same circumstance. Had the author omitted the word "good" from his law, he might have made it still clearer than he does that the law of continuation is an inevitable fact of pattern perception which is independent of consequents. The degree of deviation, the degree to which the evident meaning differs from the hypothetical meaning, will then always be a measure of affect; and, as the author points out, good music is a neat balance between "good" and "bad" continuations. The other two principles of pattern perception, completion and closure, and weakening of shape, are actually discussions in detail of the effects of a law of continuation in actual practice. It is demonstrated that logically affective meanings are the result of careful arrangements in the musical experience of good and bad continuations. Completion and closure is the result of good continuation, incompleteness and failure to close is the result of bad continuation. The author is careful to point out that neither is a satisfactory end in itself, that

the intention of the composer and the structural demands of his intended affective communication may call for either completion or lack of completion. Shape may be made crystal clear by the proper balance between good and bad continuation; it may be weakened, again intentionally, by too much good or bad continuation.

It is hoped that this brief summary does justice to the basic theses of the book which Mr. Meyer supports with sensitive analyses of standard works. If there are any weaknesses in the argument, they would lie in his reliance on a scalar concept of tonality (which this reviewer feels is more common to trained musicians than to the lay listener and hence could not be the basis for any affective meanings for the lay listener), and a limited definition of meter and rhythm which obscures the demonstrations of temporal continuation. Gestalt psychologists are warned that Mr. Meyer is clearly a member of the learning theory school although he appears to understand both the strengths and weaknesses of the Gestalt viewpoint.

Altogether, it is a book that should be required reading for any student of music, be he composer, performer, or theorist. It clears the air of many confused notions that have hampered the development of a realistic and useful theory of music, and it lays the groundwork for extensive studies in the basic problem of music theory and aesthetics, the relationship between pattern and meaning.

DAVID KRAEHENBUEHL

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CONTEMPORARY TONE-STRUCTURES. By Allen Forte. (Bureau of Publications, Teachers College, Columbia University, New York, N. Y., 1955, pp. 194, $3.75).

This book is presumably drawn directly from a thesis, and the author feels that it will be interesting primarily to teachers, although he hopes it may find other readers as well.

The book's purpose is: "to provide effective procedures and techniques for the analysis of contemporary tone-structures, and to demonstrate the application of those procedures and techniques in a number of intensive analyses."

The author acknowledges the difficulty of treating verbally the technical features of music, and offers as an aid a series of "analytic sketches." These sketches are in the book proper, and they are also given as a reprinted insert which can be held open to the proper place while reading the analytical discussions, avoiding having to turn the pages back and forth. The music analyzed is a selection of six short pieces and three longer ones by representative contemporary composers. Complete pieces rather than excerpts are given, to avoid possible misinterpretation through loss of the proper context.

The preface acknowledges that this study is indebted to Schenker's method of analysis.

Before discussing the specific procedures used in this book, the author in Chapter 1 defines analysis and its purpose according to his point of view. He says: "Analysis is neither composition, nor a method of teaching composition; nor is it perception, or a way of learning to hear. It is a systematic attempt to obtain significant information about a tonal structure."

That the composers themselves agree with the results of the analysis is not necessary, according to Forte, as the logic of their creations may not be apparent to them. Also, they lack a certain necessary humility toward structure.

It is emphasized that a major feature of this study is its attempt to discover the structural premises and postulates of individual compositions without recourse to a pre-established theory. But the book is not, however, intended to be a codification of contemporary practice, or to lead to such a codification. Even if there were a well-codified theory, Forte points out, individual pieces would require individual treatment. Furthermore, it is always the unique, not the general, which is of the most interest in analysis.

The second chapter, "Fundamental Considerations," presents broad generalities about theory, from which analysis can proceed.

A reworking of a definition by Korzybski provides this definition of structure: "A musical structure is a complex of ordered and interrelated tonal events which unfolds in time." "Order" and "relations," the two aspects of tonal events in structure, are discussed in separate paragraphs. Then follows a Schenker-like description of structure on the levels of foreground, middleground, and background, and large and small spans. Tonal functions are mentioned briefly. Rhythm and tone color are eliminated from consideration on the grounds that their roles are "differential" (the word is used roughly in the mathematical sense—these elements are derivations of the main elements).

Traditional music is discussed in this chapter as though it depended simply upon postulates, and there is a brief attack upon the "natural" basis, since it excludes many possible postulates for musical construction. If there are no limitations imposed by nature, any postulate is as valid as any other, and analysis is simply a matter of discovering the postulate of a given work.

A final paragraph in this chapter is called "Structural Postulates of Contemporary Music." This paragraph does not go into detail. It is explained that while the whole chapter deals in cursory fashion with all the points it raises, these points are discussed in more detail in the analytical chapters devoted to the individual pieces.

Chapter 3 deals with analytical procedure. The progression

should be from the larger elements to the smaller ones, according to Forte; trying first to discover the functions of individual tones yields nothing. But when the analyst does consider the individual tones, he will have to evaluate them, as they will not be equal in structural value. The tones will be examined first in a linear context, as the horizontal or linear element is more dynamic than the vertical or harmonic element. Only the linear element is considered to unfold in time, therefore it is the element most in accord with the previously given definition of structure.

A list of factors is given, not intended to be representative or in the proper order, by which one may determine the value of a tone in relation to other tones. The discussion of analytical procedure is then directed to occurrences in the unfolding of form—statement, generation, completion, etc.

Reduction, the gradual elimination of tones, is the process by which one gets inside the music, to its basis. This is Schenker—the elimination of foreground details to get to the middleground, and reduction of the middleground to get to the core of the work.

The final paragraph of this chapter speaks of terminology. Terms like "melodic" and "harmonic" are omitted because they bring up confusing associations in contemporary analysis.

Chapters 4 through 12 (pages 25 through 143) are verbal explanations of the analyses of the following works:

Igor Stravinsky, Larghetto from The Five Fingers, 1921
Darius Milhaud, Midi from Une Journée, 1946
Roger Sessions, Number III from My Diary, 1939
Aaron Copland, Number 3 from Four Piano Blues, 1948
Béla Bartók, Number VIII, from Fourteen Bagatelles, Op. 6, 1908
Paul Hindemith, Fuga undecima in B from Ludus Tonalis, 1942
Arnold Schoenberg, Phantasy for Violin with Piano Accompaniment, Op. 47, 1951
Igor Stravinsky, Petrouchka, 1911
Bela Bartok, Fourth String Quartet (I), 1928.

Pages 149 through 194 give the scores of all except the last three larger works, and "analytic sketches" are given for all of them. These pages are also reprinted and placed in the back of the book as an insert (as mentioned earlier), for the convenience of the reader.

So much for a summary of the contents of the volume, and now for an estimate of its value. Does it accomplish what it sets out to do, and who will benefit from it?

As to the first question, it does not fully accomplish its purpose ("to provide effective procedures and techniques... and to demonstrate their application..."). The explanation of procedures and techniques (covering twenty-four pages) is inadequate to support their demonstration in the remaining one hundred eighteen pages. Such a proportion

reversed would have made a more useful book. The author was aware of this, as he says the fundamental considerations in Chapter 3 are "admittedly given a cursory treatment." He depends on having the reader grasp his methods more fully by following through each of the individual analyses. The question is whether or not the reader will be able to, or will care to, follow through after the not too fully expounded introductory chapters. It is doubtful whether any reader who is equipped to follow and understand the book in its present form would gain anything new in analytical technique, and the poorly equipped reader would almost surely be lost from the beginning. The answer to the second question (who will benefit from the book?) is most likely Forte himself, as his effort in making the analyses placed him in close contact with the music. But his discussions of the analyses do not necessarily do the same for his readers.

Forte says that the verbal analyses cannot possibly cover every step, and that the analytic sketches ought to explain themselves. Actually, only the most painstaking study, with the book in one hand and the music in the other, makes it possible to follow Forte's thinking. And in almost every bar there are questions. Why is this tone removed in the reduction and that one left in? Why are lines discussed when harmonies are plainly the most important feature? And so on and so on. The answers to all such questions should have been taken care of (in principle) in the first part of the book, but one cannot find there more than the most general hints. In any case, there are certainly many possible differences of opinion, so that any one of these analyses, in itself, would be of little value. Teachers, for example, could not send their students to this book for enlightenment about these pieces, or about the styles and techniques of the composers. Nor could they themselves extract a method from it by which they (for the benefit of their students) could make analyses of other works.

That such a low evaluation must be placed on this book is just cause for disappointment; theoretical works on contemporary music are scarce, and they are sorely needed. Perhaps another book by Forte, directed in a more fortunate way, could be a really useful contribution to this neglected area of writing on music. That is, if Forte is really capable of coming to grips with basic theory. And there are parts of this book that make one wonder.

For instance, in the second chapter he makes a flimsy attack on explanations of tonal phenomena which look to the nature of sound as their basis. This attack is in the interest of an approach by which musical compositions are considered to be based only on postulates. It is certainly much simpler to regard every tonal technique simply as a postulate, easily replacable by any other, than to search for the common roots of all techniques in the nature of sound (both external sound, and sound as it is perceived by us). If techniques are just individual postulates, no common basis has to be found for those of the past and those of the present — one only has to find the new postulate. In order to discuss traditional theory as a postulate, Forte attacks the well-known explanation of the power of fifth-relationships resulting from the prominent position of the fifth in the overtone series. His first argu-

ment is the surprising statement that "The pure overtone series as it exists in nature is unknown to modern ears. Fine adjustments have been made to conform to equal temperament."

Now, this statement shows a naïveté about the physics of sound which precludes the possibility of an intelligent argument about the "natural" basis of tonal techniques. Of course modern ears hear the untempered overtone series — in every tone — even in the individual tones of the tempered piano! And tempered pitch cannot exist except on mechanically tuned instruments. In all other kinds of music-making we have nothing to rely upon except our feeling for intervals, which is the direct result of our unconscious but continuous absorption of the tone arrangement of the overtone series in all the musical tones we hear.

Forte's second argument is that "It would be just as 'natural,' and certainly as logical to over-blow the pipe, or to divide the string asymmetrically. This is, in fact, what occurs in the music of many other cultures, e.g., in Japanese music."

The distortions of natural pitch relationships in other cultures do not disprove their "naturalness" anymore than do the distortions which we employ. In our own culture, and in exotic cultures, pitches are distorted for two purposes: 1.) for expression (vibrato, "scooping," expressive flatting [in jazz], expressive sharping [the Japanese do this], raising the pitch of leading tones to heighten the sense of function, etc.); and 2.) for practical instrumental purposes (tempered keyboards or instruments using oblong vibrating plates, wind instruments with keys, fretted string instruments, etc.). Neither expressive nor practical distortions are of primary concern to the theorist; he must deal first of all with what nature presents to him. That is what is meant by "natural." One can decide to go with or against nature in art (either action is justifiable), but this does not prove that the natural is non-existent. The investigation of natural tonal phenomena is as basic to music theory as is pure science to technology. It cannot be brushed aside, as Forte tries to do, by the substitution of "postulates."

Forte's third argument against the usual explanation of the power of fifth-relationships asks why the second overtone (third partial) is chosen as the upper component in the tonic-dominant relationship. Why not the first overtone (second partial), which is even purer? The answer, of course, is that the tonic-dominant relationship depends on difference as well as similarity or "purity". The first overtone is too similar to the fundamental — too pure. Imagine a music made up of relations (both vertical and horizontal) primarily of octaves!

After these arguments, one is hardly prepared to leap along with Forte's generalizations about traditional theory, or to follow him in the one paragraph of Chapter 2 which he devotes to the postulates of contemporary theory. In fact, his account of traditional theory seems so one-sided in its constant reiteration of the importance of the tonic and dominant that one wonders exactly how deep is his understanding of it. This may be an unfair inference, but it is unavoidable on the basis of

what is in this book.

While explaining why he finds it necessary to omit some traditional terms, Forte also creates doubt as to whether he really understands them in their broader meanings. The words "melodic" and "harmonic" are omitted for reasons which are on the level one might expect from a student with only the plainest conventional training. "Melodic is omitted because it connotes a da capo aria type of texture: a single line accompanied by a succession of vertical structures, or chords. Other conventional terms — for example, harmonic — refer directly to the tonic-dominant function, and their use in a composition which does not manifest that function would therefore result in confusion." No other words to account for that which is horizontal or linear, or that which is vertical or chordal (or which pertains to the relationships between chords) are ever introduced.

There are other statements in this book that make one leap to put the author and his readers straight: that composers do not see the logic in their own creations, and lack humility towards structure; that rhythm is a differential element which can be omitted in analysis. And there are other smaller points. But to take up each of these things would result in a review larger than the first three basic chapters of the book! This corraborates, of course, the earlier criticism that the presentation is far too dense.

In his preface, the author acknowledges his debt to Schenker. Perhaps if this review were being written by a Schenker disciple it would be more perceptive and more sympathetic. I am not a Schenker disciple, and am not qualified to say how well Forte uses this method. But I will venture a few words on its appropriateness in a book of this kind.

In the nineteenth century every theory student knew what a chord was, what a melodic line was, and exactly how the forces of melody and harmony were interlaced. He could take a piece of Beethoven and say, "this is a passing tone, this a suspension, and the underlying harmony is...." His method of analysis was also reversible. He could begin with a chordal basis and add ornamental elements, as a technique of composition. Schenker's method of reduction was not so specific. One could not take his rhythmless sketch of the background of a work and build a piece from it. Nor was one supposed to do that. His method served a purpose that the other more detailed and specific type of analysis could not serve — it brought the analyzer's attention to the larger, more general aspects of tonal and linear movement. That was very interesting, since we already knew the details. But in these days what a chord is, and what is present in the texture through the action of melody are no longer commonly shared knowledge. Until we do share such a general and well-codified theory (which Forte says he does not claim to present), a Schenker type of analysis will gain nothing of great practical value.

What this book does do by its premature use of Schenker's method

is to carry on one of the less fortunate aspects of that approach. We love to fondle our favorite works of art (verbally), and this kind of not-too-specific manipulation of the tones of a piece in various stages of reduction, accompanied by verbal descriptions, can go on endlessly — spilling words and words and words, yet revealing nothing which is not better perceived in playing and listening. Without labelling each little item (as in the old way), and without determining the function of each thing (Forte calls this, derogatorily, "dissection"), taking a piece of music apart can be like taking a watch apart without observing the functions of each part. Afterwards, the table will be full of parts, functions undefined. The watch cannot be put back together, one has not really learned how to make a watch, and one does not really understand the details of how it works. One can describe the appearance of the watch in stage one, with only a few parts removed, in stage two, with more parts removed, and in stage three, with the back of the case showing. And one can say what the principle of the whole thing is — it consists of springs as a source of energy, and toothed wheels forming gears. Is this information worth much to a watchmaker? — to a person who needs to tell the time? We may ask the same questions about these analyses. Are they of real interest to the composer or teacher? — to the listener or reader?

HOWARD BOATWRIGHT

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Other Books Not Reviewed

Carroll, Joseph Robert. AN APPLIED COURSE IN GREGORIAN CHANT. Gregorian Institute of America, Toledo, Ohio, 1956, pp. 147, $3.00.

Dorati, Antal. DORATI'S INSTRUMENTATION CHART: A Guide for Composer's and Arrangers. University of Minnesota Press, Minneapolis, Minn., 1956, 1 sheet and 5 charts in envelope, $10.00.

Edwards, Arthur C. THE ART OF MELODY. Philosophical Library, New York, N.Y., 1956, pp. 266, $4.75.

Korn, Richard. ORCHESTRAL ACCENTS (the interpretation of accents arrived at through the analysis of selected passages in the light of the composer's general style). Farrar, Straus and Cudahy, New York, N.Y., 1956, pp. 276, $3.50.

Kuhns, Richard Francis. PERCEPTION, UNDERSTANDING AND STYLE: A Study in the Foundations of Criticism Developed from an Examination of Artistic Creativity and Appreciation. University Microfilms, Ann Arbor, Mich., 1956, Mic 56-859, $4.76.

Marshall, George Ruffin. THE HARMONIC LAWS IN THE MADRIGALS OF CARLO GESUALDO. University Microfilms, Ann Arbor, Mich., 1956, Mic 56-1983, $2.64.

Morgenstern, Sam, ed., COMPOSERS ON MUSIC: An Anthology of Composer's Writings from Palestrina to Copland. Pantheon Books, Inc., New York, N.Y., 1956, pp. 584, $7.50.

Norman, Philip B. HARMONY. Consolidated Music Publishers, Inc., New York, N.Y., 1955, pp. 122, $3.00.

Ogdon, Wilbur Lee. SERIES AND STRUCTURE: An Investigation into the Purpose of the Twelve-Note Row in Selected Works of Schoenberg, Webern, Krenek and Leibowitz. University Microfilms, Ann Arbor, Mich., 1956, Mic 56-551, $4.26.

Ottman, Robert William. A STATISTICAL INVESTIGATION OF THE INFLUENCE OF SELECTED FACTORS ON THE SKILL OF SIGHT-SINGING. University Microfilms, Ann Arbor, Mich., 1956, Mic 56-1194, $3.58.

Rogers, Helen Olive. THE DEVELOPMENT OF A CONCEPT OF MODULATION IN THEORY FROM THE 16th TO THE EARLY 18th CENTURY. University Microfilms, Ann Arbor, Mich., 1956, Mic 56-552, $6.03.

Tipple, Esther (Watson). MUSIC LOGARITHMIC SPIRAL. Spaulding-Moss Co., Boston, Mass., pp. 5.

Tusler, Robert L. THE STYLE OF J. S. BACH'S CHORALE PRELUDES. University of California Press, Berkeley and Los Angeles, Calif., 1956, pp. 68, $2.00.

Wykes, Robert Arthur. TONAL MOVEMENT IN THE POLYPHONIC BALLADES, RONDEAUX, AND VIRELAIS OF GUILLAUME DE MACHAUT. University Microfilms, Ann Arbor, Mich., 1956, Mic 56-1529, $1.56.

BIBLIOGRAPHY OF CURRENT PERIODICAL LITERATURE

Compiled by
Donald Loach

The articles listed below appeared in periodical publications during 1956.

Music Periodicals in English

Bruce, I. M., "Notes on Mozart's Bar-Rhythms",
Music Review 17:35-47, Feb 56.

Clapham, John, "Chromaticism in the Music of Mozart",
Music Review 17:7-18, Feb 56.

David, Hans T., "Mozartean Modulations",
Musical Quarterly 42:193-212, Apr 56.

Elston, Arnold, "Some Rhythmic Practices in Contemporary Music",
Musical Quarterly 42:318-329, Jul 56.

Evans, Peter, "Hindemith's Keyboard Music",
Musical Times 1365:572-575, Nov 56.

Jacobs, R. L., "Gestalt Psychologists on Music: a discussion of the article on gestalt psychology in Grove V",
Music Review 17:185-188, Aug 56.

Keller, Hans, "Key Characteristics",
Tempo 40:5-16, Summer 56.

Keller, Hans, "Serial Octave Transpositions",
Monthly Musical Record, Vol. 86, No. 976:139-143, Jul 56 and No. 977: 172-177, Aug 56.

Lowinsky, Edward E., "On Mozart's Rhythm",
Musical Quarterly 42:162-186, Apr 56.

Milner, Anthony, "The 'Lunatic Fringe' Combed" [a summary of articles dealing with the post-Webern school in Germany and 'concrete music' in France],
Musical Times 1364:516-518, Oct 56.

Milner, Anthony, "Vocal Element in Melody",
Musical Times, 1357:128-131, Mar 56.

Misch, Ludwig, "Fugue & Fugato in Beethoven's Variation Form",
Musical Quarterly 42:14-27, Jan 56.

Neighbor, Oliver, "A Talk on Schoenberg for Composers' Concourse", The Score 16:19-35, Jun 56.

Potiron, Henri, "Harmony and Modal Composition", Gregorian Review III, No. 5:41-50, Mar 56.

Ratner, Leonard G., "Eighteenth-Century Theories of Musical Period Structure", Musical Quarterly 42:439-454, Oct 56.

Satterfield, John, "Dissonance and Emotional Content in the Bach Two-Part Inventions", Music Review 17:273-281, Nov 56.

Sessions, Roger, "Song and Pattern in Music Today", The Score 17:73-84, Sep 56.

Siler, Henry, "Toward an International Solfeggio", Journal of Research in Music Education 4:40-43, Sep 56.

Weakland, Rembert, O.S.B., "Hucbald as Musician and Theorist", Musical Quarterly 42:66-84, Jan 56.

Other Periodicals in English

Ames, Van Meter, "What is Form?", Journal of Aesthetics and Art Criticism 15:85-93, Sep 56.

Michell, Joyce, "A New Approach to an Aesthetic of Music", Journal of Aesthetics and Art Criticism 15:227-231, Dec 56.

Schutz, Alfred, "Mozart and the Philosophers", Social Research 23:219-242, Summer 56.

Stolnitz, Jerome, "On Artistic Familiarity and Aesthetic Value", Journal of Philosophy 53:261-276, Apr 12, 56.

Yasser, Joseph, "Variation Form and Synthesis of Arts", Journal of Aesthetics and Art Criticism 14:318-323, Mar 56.

Music Periodicals in Other Languages

Ballif, Claude, "Introduction à la Métatonalité —Vers une solution tonale et polymodale du problème atonal", Polyphonie III, No. 3/4:5-117, 1956.

Beurmann, Erich Herbert, "Die Reprisensonaten Carl Philipp Emanuel Bachs", Archiv für Musikwissenschaft 13:168-179, 1956.

Schmiedel, Peter, "Zur Frage der Dur-Moll-Polarität",
Archiv für Musikwissenschaft 13:142-167, 1956.

Tischler, Hans, "The Evolution of the Harmonic Style in the Notre-Dame Motet",
Acta Musicologica 28:87-95, Fall 56.

Wiora, Walter, "Zum Problem des Ursprungs der mittelalterlichen Solmisation",
Die Musikforschung 9:263-274, 1956.

Addendum:

Pinkerton, Richard C., "Information Theory and Melody",
Scientific American, Vol. 194, No. 2:77-87, Feb 56.

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